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## CARCINOMA OF THE BREAST

### THE VALUE OF PREOPERATIVE AND POSTOPERATIVE IRRADIATION

RUSSELL H BOGGS MEMORIAL LECTURE

GEORGE E PFAHLER, M.D., ScD

AND

JACOB H VASTINE, MD

PHILADELPHIA

Russell H Boggs was especially interested in preoperative and postoperative irradiation of carcinoma of the breast. The value of irradiation in the treatment of this condition can be incontrovertibly demonstrated by the results obtained with recurrent carcinoma, in which there can be no question as to the diagnosis or as to the ultimate outcome if the patient is untreated. We have treated 491 patients with postoperative recurrence. Of those who had local recurrence, 39.7 per cent were well five years. Of those who had axillary or supraclavicular recurrence, 23.3 per cent were well five years. Of those with distant metastases, 5.1 per cent were symptom free in five years, and 18.5 per cent of all the patients with recurrence and metastasis, regardless of location, were alive and symptom free five years after first coming under our care.

The operative results have not been appreciably improved in the past forty years (Hutchinson,<sup>1</sup> Lewis and Reinhoff<sup>2</sup>), and the operation has been fairly well standardized and mastered by many surgeons. If patients can be operated on while the disease is confined strictly to the breast (stage 1<sup>3</sup>), 70 per cent can be expected to get well, even with no associated irradiation. No combination of treatment can compensate for delayed diagnosis or delayed treatment. If the disease has extended to the axillary glands (stage 2), only 20 per cent (Adair<sup>4</sup>) of the patients are expected to be alive at the end of five years if operation alone is employed. If the disease has extended beyond the breast and the axillary lymph nodes (stage 3), almost none of the patients will be living five years after operation alone, and there is considerable evidence to indicate that the patient's life may be shortened.

Unfortunately only 5 or 10 per cent of all patients coming to a surgical clinic are still in stage 1. Of

2,396 patients with operable carcinoma studied by Harrington<sup>5</sup> at the Mayo Clinic, only 20.4 per cent were in stage 1. If one includes also those whose condition was inoperable, the percentage in stage 1 will probably not be over 10 for all cases. We will assume that the patients in stage 1 will be treated by surgical methods alone and that approximately 70 per cent will be well for five years. There will remain then approximately 80 per cent of the patients with operable carcinoma in stage 2, of whom only 23 per cent get well, while if thorough and skillful irradiation is added, the number of five year recoveries will be approximately doubled. On account of the limited time, this discussion will be confined to cancer of the breast in stage 2.<sup>6</sup> It is understood that when a surgeon operates with a clinical diagnosis of carcinoma of the breast in stage 1 and finds at operation that the axillary glands are involved, the condition should be immediately classed in stage 2, and the patient should receive postoperative irradiation even though no preoperative treatment has been given.

### THEORETICAL AND BIOLOGIC EVIDENCE FAVORING PREOPERATIVE IRRADIATION

1 *Tendency of Preoperative Irradiation to Devitalize or Destroy the More Malignant Types of Cells*—It is well known that the microscopic grade of malignancy has much to do with the prognosis of carcinoma of the breast after operation. As indicated in statistics prepared by Harrington at the Mayo Clinic, 91.4 per cent of the group having invasion of the lymph nodes had cancer of microscopic grades 3 or 4, and of the 481 patients with these two more malignant grades who were traced, only 20.5 per cent who had operation alone lived five years. It will be further observed from his table that the patients with cancer of microscopic grades 3 and 4 represented 90 per cent of the 1,907 patients with involvement of the lymph nodes and those with grades 1 and 2 approximately 10 per cent. It must be clear, therefore, that the greatest problem is in dealing with the microscopically more malignant grades 3 and 4, with axillary involvement or in the clinical stage 2. This type represents approximately 80 per cent of all operable cancer. These microscopic grades of malignancy can be determined only after a complete operation and a study of the entire breast (Dawson and Tod<sup>7</sup>). Even grades 1 and 2 are liable to contain some of the more malignant cells. Therefore, when axillary involvement is present, all patients should have both preoperative and postoperative irradiation.

Memorial address given in honor of Dr. Russell H. Boggs, a pioneer in radiology and a leader in roentgen therapy, read before the Section on Radiology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

<sup>1</sup> Hutchinson R. G. Surg. Gynec. & Obst. 62: 653 (April) 1936.  
<sup>2</sup> Lewis Dean and Reinhoff W. F. Ann. Surg. 95: 336 (March) 1932.

<sup>3</sup> We are using the term clinical stage 1, 2, 3 and 4 to distinguish from the microscopic characteristics of malignancy, grades 1, 2, 3 and 4 as referred to by Broders, MacCarty, Harrington, Schmitz, Lee and others. Standardized dictionary definition: stage, a single step of the gradual process, grade, degree in order of series.

<sup>4</sup> Adair Frank E. Am. J. Roentgenol. 35: 58 (March) 1936.

<sup>5</sup> Harrington Stuart W. Surg. Gynec. & Obst. 56: 438-441 (Feb. No. 2A) 1933. 60: 499-504 (Feb. No. 2A) 1935.

<sup>6</sup> This subject was discussed in more detail by Dr. Pfahler in the Caldwell Lecture before the American Roentgen Ray Society, Sept. 14, 1937.

<sup>7</sup> Dawson E. K. and Tod M. C. Edinburgh M. J. 41: 61 (Feb.) 1934.



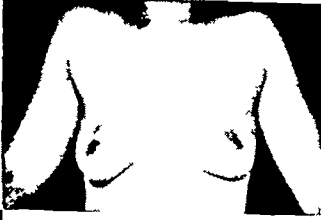
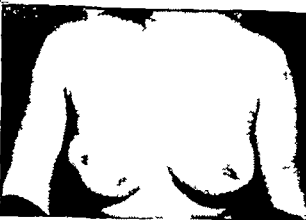

It happens that, so far as the microscopic classification is concerned, grades 3 and 4 are especially radio-sensitive while grades 1 and 2 are much less so. This too is a matter of common knowledge and common agreement. Unfortunately, grades 3 and 4 lead to early and extensive metastasis. This is evident in the table mentioned, which shows that in 91 per cent of the total cases of involvement of the lymph nodes the cancer was of grades 3 or 4. It is also self evident that unless the irradiation is applied to the area in which the malignant cells are located ultimate failure will

recurrences due to implantation during operation and should render less liable to take place the successful implantation of emboli that have been carried through either the lymph stream or the blood stream, which may result from the manipulations concerned with the operative procedures. Such devitalizing effect on the more malignant cancer cells surely occurs immediately, even though it cannot be demonstrated microscopically. Therefore, there is no advantage from this standpoint in prolonging the interval before operation, and the operation can take place as soon as the proper amount

of irradiation has been given to the tumor areas, which we estimate to be about 900 roentgens.

**2 Normal Tissues Less Receptive to Implantation After Preoperative Irradiation**—Biologic experiments (Murphy<sup>9</sup> and Russ and Scott<sup>10</sup>) indicate that in addition to the effect of irradiation on the malignant cells there is an effect on normal tissue which is detrimental to implantation of carcinoma. Russ and Scott utilized rats and have exposed to irradiation two of the opposing quadrants of the outer two thirds of a circle of skin, protecting the central area of the circle and the other two quadrants. They then implanted malignant disease in the unexposed center. In all instances the tumor tissue grew by preference into the unirradiated areas. This effect was evident even when as little as 50 per cent of an erythema dose was used and was also effectual even when the irradiation was given several days before the inoculation.

In view of these facts, preoperative irradiation is definitely indicated especially when carcinoma of the breast is in clinical stage 2. The preoperative treatment which we recommend can usually be given in

STAGE 1	STAGE 2	STAGE 3
		
SMALL, ISOLATED, MOVABLE TUMOR IN THE BREAST NO PALPABLE LYMPH NODES NO ROENTGENOLOGIC EVIDENCE OF INTRA THORACIC OR SKELETAL METASTASES	LARGER TUMOR IN THE BREAST FIXATION OF TUMOR TO SKIN OR PECTORAL MUSCLES, WITH PALPABLE AXILLARY LYMPH NODES, OR MICROSCOPIC EVIDENCE OF AXILLARY METASTASES	TUMOR IN THE BREAST WITH AXILLARY LYMPH NODES, AND SUPRACLAVICULAR OR DISTAL METASTASES
RADICAL OPERATION ONLY OR RADICAL OPERATION PLUS POSTOPERATIVE IRRADIATION	<b>TREATMENT</b> PRE-OPERATIVE IRRADIATION SMALL SERIES FOLLOWED PROMPTLY BY RADICAL OPERATION AND POSTOPERATIVE IRRADIATION	IRRADIATION ONLY OR IRRADIATION PLUS OPERATION IF DISEASE CAN BE MADE OPERABLE BY IRRADIATION—THEN POSTOPERATIVE IRRADIATION
OPERATION ONLY— 70 PERCENT AVERAGE— ALIVE AND WELL IN 5 YEARS  OPERATION PLUS POSTOPERATIVE IRRADIATION— 71 PERCENT ALIVE AND WELL IN 5 YEARS	<b>PROGNOSIS.</b> OPERATION ONLY 28 PERCENT—AVERAGE— ALIVE AND WELL IN 5 YEARS PRE-OPERATIVE IRRADIATION, OPERATION PLUS POSTOPERATIVE IRRADIATION— 57 PERCENT ALIVE AND WELL IN 5 YEARS	PROBABLY NOT MORE THAN 5 PERCENT ALIVE AND WELL IN 5 YEARS  PROLONGATION OF LIFE AND RELIEF OF PAIN BY IRRADIATION

Synopsis of diagnosis treatment and prognosis

result. Therefore, the earlier a patient is treated by irradiation, the better will be the end result. Bloodgood<sup>8</sup> recommended immediate irradiation of the axilla and the breast in all cases of doubtful or malignant tumor.

Because the more malignant type of cells (stage 3 and 4) are rendered less malignant by even a moderate amount of irradiation, it is fair to assume that such irradiation given to a patient with carcinoma of the breast will partially devitalize the more malignant type of cells, which are the cause of extensions and of the surgeon's failures. Irradiation should decrease the

approximately two weeks, and the patient can be operated on usually during the third week. There is therefore no great delay in the operation and such irradiation will not interfere with the technical procedures of the operation itself. Preoperative treatment has been recommended by one of us (Pfahler) since 1915, but until recent years relatively few patients have been referred for such treatment and not enough patients have been given the short type of preoperative treatment to make any statistical statement of value.

<sup>8</sup> Bloodgood, Joseph C. in discussion on Cutler, Max. The Problem of Radiosensitivity. J. A. M. A. 103: 1204-1210 (Oct. 20) 1934.

<sup>9</sup> Murphy, J. B. and Nakahara, W. J. Exper. Med. 32: 327 (March) 1921.  
<sup>10</sup> Pfahler, G. E. and Widmann, B. P. Am. J. Roentgenol. 14: 550-562 (Dec.) 1925.  
<sup>10</sup> Russ, S. and Scott, G. M. Brit. J. Radiol. 32: 229 (Aug.) 1937.

In the past, preoperative treatment has been given to three types of patients (1) those with cancer in clinical stage 2, previously described, (2) those with cancer belonging to Steintal group II-C, which is doubtfully operable but which is made more operable by preoperative treatment, and (3) those with cancer which is totally inoperable but which by prolonged treatment and an interval of two or more months is sometimes made operable. For the sake of brevity, we will confine this discussion to cancer which has invaded the axillary nodes but which is still clearly operable (stage 2).

#### THEORETICAL AND BIOLOGIC CONSIDERATIONS FOR POSTOPERATIVE IRRADIATION

Local postoperative treatment is intended (1) to destroy any malignant cells that may have been transplanted during operation, (2) to destroy any microscopic remnant of cancerous tissue which the surgeon may have missed and (3) to render the normal tissue more resistant to cancerous growth. Definite evidence of implantation is furnished by the rare observance of stitch hole recurrences. Other more frequent implantations probably occur under the skin flap. It is our impression that remnants of cancerous tissue are rendered more malignant and also more radiosensitive by the congestion following the traumatism of operation. It is generally admitted that local and regional recurrence is the result of incomplete operation but since 38 per cent of the patients whose operation is a failure have local recurrences and 15 per cent axillary recurrence (Creyssel and Morel<sup>11</sup>), it is seen that 53 per cent of the operations which fail are incomplete. All

tive treatment is advised for all patients operated on. It is the accepted procedure in most of the large clinics both in this country and abroad.

#### TIME FOR POSTOPERATIVE IRRADIATION

A review of our own records as well as a study of the literature shows that many patients are sent for "postoperative" treatment at a time when they actually have evidence of recurrent disease. It is our opinion

TABLE 2—Recent Comparative Statistics from Various Clinics as Collected from the Literature

Author	Operation Alone Percentage Living Five Years			Operation and Irradia- tion Percentage Living Five Years		
	No of Patients	Stage 2	All Patients Oper- ated On	No of Patients	Stage 2	All Patients Oper- ated On
Lane Claypon Janet E Report on the Late Re- sults of Operation for Cancer of the Breast London His Majesty's Stat Off 1928	2 000	247				
Hutchinson <sup>1</sup>		230	231		410	409
Dawson and Tod <sup>7</sup>	5 615		343	1 781		444
Hintze <sup>12</sup>	4 902		284	2 822		379

This group represents cross section statistics collected by various authors from large clinics in various parts of the world. Even this collection shows a gain of approximately 2 per cent in the results of postoperative irradiation and operation as compared with operation alone.

that, to get the best value from postoperative treatment, the patient should be referred as soon after the operation as her general condition and circumstances will permit, which is usually within ten days to two weeks, even though the wound is not entirely healed. We have not found that postoperative irradiation interferes with the healing of the wound, nor have we found that the wound breaks down because of postoperative irradiation.

#### OVARIAN STERILIZATION AS A PREOPERATIVE OR A POSTOPERATIVE PROPHYLACTIC MEASURE

It is well known that cancer of the breast is more malignant in young women (Sistrunk and McCarty<sup>13</sup>). Dresser<sup>14</sup> found that of "forty-eight women under 40 treated by radical mastectomy, only 12.5 per cent were free from disease at the end of three years." Lee<sup>15</sup> said "Of the patients 40 years or under, 27 per cent were alive and well at the end of five years, whereas of those over 40 years of age, 45 per cent were alive and well at the end of five years." Cancer of the breast also grows more rapidly during pregnancy, (Steel<sup>16</sup>). Therefore, pregnancy should be avoided in a case of cancer of the breast. Experimental evidence indicates that the ovarian hormones stimulate the production of cancer of the breast in animals which have any susceptibility (Loeb,<sup>17</sup> Lacassagne<sup>18</sup>). In cases of recurrence or metastasis, oophorectomy (Schinzinger,<sup>19</sup> Beatson,<sup>20</sup> Lett,<sup>21</sup> Boyd,<sup>22</sup> Torek,<sup>23</sup> Thompson<sup>24</sup> and Foveau de Courmelles<sup>25</sup>) and also ovarian

TABLE 1—Recent Comparative Statistics from the Same Clinics

Author	Operation Alone Percentage Living Five Years			Operation and Irradia- tion Percentage Living Five Years		
	No of Patients	Stage 2	All Patients Oper- ated On	No of Patients	Stage 2	All Patients Oper- ated On
Siemens W Strahlen- therapie 47 627 (Aug 9) 1933	104	336		185	532	
Harrington <sup>8*</sup>	604	243		1 447	288	
Centil Francisco and Cuedes Bernard Arq d pat 2 122 1928	42	206		63	425	
Adair <sup>4</sup>		206	30		230	406
Hintze <sup>12</sup>	606		305	183		530
Portmann <sup>5</sup>	80		306	99		460
Canz Trinet Strahlen- therapie 77 413 444 1936	3 599		312	118		400

It can be seen that the end results were improved by postoperative irradiation as compared with operation alone from 11.4 to 73.7 per cent for all cases and from 1.5 to 35.3 per cent for carcinoma in stage 2 according to different authors.

\* Operations were done at the Mayo Clinic but postoperative irradiation mostly by radiologists throughout the country. The irradiation therefore is not likely to have been on as high a plane as the operation.

of these recommendations are intended to lessen the number of failures connected with surgical intervention, for in the clinics where the basic principles of radiotherapy have been followed most closely and where the radiologists have mastered a good technic, postoperative irradiation has become a routine procedure in all cases in which the disease has spread beyond the breast. Hintze<sup>12</sup> stated that 80 per cent of the patients with cancer of the breast in the Surgical University Clinic in Berlin receive postoperative treatment, and postopera-

11 Creyssel Jean and Morel Andre Bull Assoc franç p l'étude du cancer 25 724 (Jan) 1936

12 Hintze Arthur Strahlentherapie 41 601 1931 Arch f klin Chir 173 429 1932

13 Sistrunk W E and McCarty W C Ann Surg 75 61 69 (Jan) 1922

14 Dresser Richard Am J Roentgenol 35 384 391 (March) 1936

15 Lee B J Am J Surg 20 405 (May) 1933

16 Steel David Radiology 26 700 705 (June) 1936 Steintal C F quoted by Lyman J E A in the Proceedings of the Third Inter-  
national Congress of Radiology, Paris 1931, pp 417-438

17 Loeb Leo Estrogenic Hormones and Carcinoma J A M A 104 1597 1604 (May 4) 1935

18 Lacassagne A Am J Cancer 27 217 (June) 1936

19 Schinzinger Chir kongress 1 28 1889 Munchen med Wchnschr 52 1724 1905

20 Beatson G T Lancet 2 104 107 and 162 165 1896

21 Lett Hugh Lancet 1 227 1905

22 Boyd S Brit M J 2 1161 1167 1900

23 Torek Franz Ann Surg 60 476 (Oct) 1914

24 Thompson A Brit M J 2 1538 1541 1902

25 Foveau de Courmelles F V Compt rend Acad d sc 140 606 1909

sterilization by irradiation (Diesser, Hoffman<sup>26</sup>) have been followed in a considerable number of cases by a disappearance of the lesions. A woman who has had carcinoma of the breast is proved to be susceptible to the disease, and Harrington's statistics indicate that 75 per cent of those with operable carcinoma have remnants of the disease in the system after operation, or

TABLE 3—Recent Comparative Statistics of Results as Collected from Special Clinics

Author	No. of Patients Living 1½ Years	Stage 2	All Patients Operated On
Harrington <sup>25</sup>	1011	200	331
Gould Pearce, in Hutchinson, R. G. Surg. Gynec. & Obst. 62, 653, 1936	101	220	331
Abell Irwin Surg., Gynec. & Obst. 48, 1934	217	260	460
Greenough, R. B. Surg., Gynec. & Obst. 54, 437, 1934	171	310	360
Redman, J. Birmingham M. Rev. 11, 9, 1936	106	410	410
Jessop W. H. G. Lancet 2:421, 1936	216	305	480
Klingstein Percy Ann Surg. 90, 280, 1932	170	170	230
Lewis and Reinhold <sup>27</sup>	420		180
Cusk, G. J. Proc. Roy. Soc. Med. 60, 1933			360
Average percentage		27.0	30.0
Operation and Postoperative Irradiation, Percentage Living 1½ Years			
Westermarck, Nils, and Jacobaeus, H. O. Acta radiol. 11, 647, 1930	70	380	370
Ivans W. A., and Leucutha Trahan Am. J. Roentgenol. 24, 673, 1930	175	463	461
Wintz H. Fourth Internat. Radiological Congress Zurich 1934, p. 401	97	515	
Jee <sup>28</sup>	217	530	410
Weisswange W. M. H. J. Ergebn. d. med. Strahlenforsch. 7, 513, 1936	171	271	537
Billeh	164		390
Gobel R., and Mages, A. Med. Welt 5, 1076, 1931		373	477
Webster J. J. D. Brit. M. J. 2, 47, 1932	3-8		420
Nicholson, W. P., and Berman, M. D. Ann Surg. 103, 683, 1936	74		308
Hummel Rudolph. Röntgenpraxis 4: 306, 1932	115		687
Pfahler and Vastine	209	520	524
Average percentage		39.6	46.0
Preoperative Irradiation, Operation and Postoperative Irradiation			
Westermarck	14	460	520
Wintz	87		510
Pfahler and Vastine	91	571	472
Average percentage		51.8	50.0

1 It will be observed that in these special clinics, where special attention is given to the results, they are better by operation alone and also by operation combined with irradiation.

2 It should be noticed also that preoperative and postoperative irradiation together give better results than postoperative irradiation alone.

3 The average of the percentages obtained by these authors shows a definite advantage for both postoperative irradiation and for the combination of preoperative irradiation, operation and postoperative irradiation.

they would not have died of the disease within five years. Consequently any stimulation in such cases is liable to shorten life. Therefore, we recommend ovarian sterilization for all women who are still in the menstrual time of life. Reports by Torek and statistics by Ahlborn<sup>27</sup> seem to indicate some value of ovarian treatment even after the menopause. Dresser, on the other hand, has not been able to recognize any benefit after the menopause.

#### TECHNIC

The technic has varied tremendously not only among different radiologists but even in our own experience. This is natural, for radiotherapy has been a rapidly developing procedure. New knowledge has accumulated since the discovery of roentgen rays approximately forty-five years ago concerning both the disease and the effects of irradiation. Therapy with these rays has been developed particularly during the past thirty-eight years, beginning with a few scattered workers and gradually spreading until now it is not only uni-

versally utilized but is being used in all branches of medicine. Our own experience (Pfahler) in treating carcinoma of the breast covers over thirty-five years, and naturally there has been a considerable variation in technic during this evolution. No technic can be standardized even yet. Considering general principles, our own technic has involved from the beginning to the present time the use of fractional dosage carried over a considerable period. Therefore, instead of reviewing all that has been done and the variations that have taken place, we will be content with a description of our own technic, which may be modified as newer knowledge is developed.

**Technic for Short Preoperative Treatment**—Short preoperative treatment is used when the cancer is still clearly in an operable stage but is no longer confined to the breast. The object is to devitalize the more malignant type of cells with moderate dosage without causing undue delay or interference with the operation itself. Ordinarily we aim to finish this preoperative treatment in approximately two weeks and to give approximately 900 roentgens through each side of the breast and through the axillary and supraclavicular region. The cross fire value of this will equal approximately 900 roentgens in the diseased area. For all this treatment we utilize 200 kilovolts, 50 cc distance and 0.5 mm of copper filtration. For portals we utilize the space from the parasternal line to the nipple line, turning the patient on the side and irradiating tangentially, so that the rays will include the chest wall but not penetrate the lungs. A similar tangential dose is given through the mammary area externally, extending from the midaxillary line to the nipple line, also tangentially, avoiding penetration of the lung but including the chest wall. An axillary portal occupies the

TABLE 4—Patients Alive Five Years Having Had Preoperative Irradiation, Operation and Postoperative Irradiation

Operation done within 30 days after the beginning of preoperative irradiation and followed by postoperative irradiation	
Stage 1	0 of 11 = 0%
Stage 2	13 of 23 = 56.5%
Stage 3	0 of 7 = 0%
The same form of treatment less than five years ago	
Stage 1	4 of 4 = 100%
Stage 2	7 of 10 = 70%
Stage 3	0 of 2 = 0%
Operation done from 30 to 60 days after the beginning of preoperative irradiation and followed by postoperative irradiation	
Stage 1	2 of 4 = 50%
Stage 2	6 of 7 = 85.7%
Stage 3	0 of 3 = 0%
Operation done more than 60 days after the beginning of preoperative irradiation	
Stage 1	8 of 11 = 72.7%
Stage 2	6 of 12 = 50%
Stage 3	0 of 13 = 0%
Total number of patients in stages 1 and 2 living five years after preoperative and postoperative irradiation	
Stage 1	10 of 26 = 38.5%
Stage 2	21 of 42 = 50%
Stage 3	0 of 23 = 0%

\* One not traced.

† Two died of intercurrent disease and are not included.

‡ One died of intercurrent disease.

§ One died of intercurrent disease, two not traced.

¶ Three died of intercurrent disease, one not traced.

space between the posterior and the anterior axillary folds, and the rays are directed upward and inward so as to irradiate the axilla, the coracoid or infraclavicular region and the deeper portion of the supraclavicular area, tangential rays are again utilized and the chest walls and the upper mediastinum included. A portal is then utilized including the supraclavicular region and the coracoid region and the rays carried from the lower

<sup>26</sup> Hoffman W. J. S. Clin. North America 13, 494-498 (April) 1933.  
<sup>27</sup> Ahlborn Hugo. Acta radiol. 11, 614, 1930.

border of the axillary fold upward and inward to the sternoclavicular junction, in stouter persons, a similar portal is utilized through the posterior axillary field, the same general principles being carried out. This should give a rather even distribution of irradiation and should give approximately an erythema dose value into all of these tissues. This amount of irradiation is intended to be supplemented by postoperative irradiation.

The technic described by Adair differs from the foregoing and was used with a different object in view. He studied 117 cases of operable cancer of the breast, in each of which a biopsy confirmed the presence of cancer. Observations were made both clinically and microscopically to note the effect of preoperative irradiation. Sixty-five patients were treated by the 200 kilovolt x-ray machine and fifty-two by the 4 Gm radium element pack. The roentgen rays were given through five different portals, and the dosage was 1,200 roentgens per portal (thirty-six cases), 1,500 roentgens per portal (eleven cases) and 1,800 roentgens per portal (eighteen cases). His object was to determine just how much total effect could be shown at the subsequent operation, and his study did not involve five year end results. Therefore it is discussed separately. He found that 1,800 roentgens per portal gave the best results—33 per cent complete disappearance of the cancer of the breast and 22 per cent complete disappearance of involvement of the axillary nodes. The radium packs gave 35 per cent and 13 per cent, respectively. The interval between the operation and the end of the preoperative irradiation varied from twelve days to three hundred days, and the average interval was sixty-six days. The majority of patients were operated on two months after the finishing of the preoperative irradiation. It is clearly seen that the object as well as the technic of this form of preoperative irradiation differs from those of the technic which we have recommended. Adair said "In all instances, irradiation caused clinical reduction in the volume of the breast tumor. To a lesser extent this was true of the axillary disease. The tumor tissue softens and commonly takes on the same consistency as the mammary tissue."

**4 Technic of Postoperative Irradiation**—We generally begin postoperative treatment through a portal occupying the supraclavicular and coracoid region, outlined approximately similar to the one utilized in the preoperative treatment, and for a second portal of entry we usually use the posterior axilla, with the arm thrown over to the opposite shoulder and the rays directed into the axilla, into the deeper part of the supraclavicular region and toward the upper part of the mediastinum. Generally the arm cannot be abducted sufficiently to get a portal of entry into the axilla itself after operation. As a third field we utilize a large area extending from the lower border of the coracoid and supraclavicular portal to the level of the epigastrium and extending from the right border of the sternum to the left anterior axillary fold. Because of the large area involved, because of the lung and the heart underneath and because irradiation of this area is apt to give rise to radiation sickness, we give relatively smaller doses over this field. We utilize for postoperative treatment over this portal the so-called low voltage technic, using 135 kilovolts, 2 mm of aluminum filtration and 50 cm distance. Generally we can give only about 200 or 300 roentgens in each application, sometimes less, but we aim to deliver into this area a total of approximately 1,800 to 2,400 roentgens, counting both preoperative

and postoperative treatment. The treatment is given according to the "saturation technic," and we should not exceed a full erythema dose at any time. We aim to deliver into the axilla, coracoid and supraclavicular region approximately 1,800 to 2,400 roentgens. This will bring about a definite erythema, but we have not found that it interferes with the healing of the wound or the convalescence of the patient. We believe that treatment should begin about two weeks after operation, while the congestion is present and while any cells that

TABLE 5—Patients Alive Five Years After Having Had Operation and Postoperative Irradiation \*

Treated Between 1902 and 1922				
		Without Involvement of Glands at Time of Operation	With Involvement of Glands at Time of Operation	
Alive and well		30 = 66.0%	46 = 40.7%	
Dead of carcinoma	18		67	
Dead of intercurrent disease	3		5	
Not traced	6		13	
Total		62	131	
Treated Between 1922 and 1932				
	Stage 1	Stage 2	Stage 3	All Patients Operated On
Alive and well	32 = 72.7%	26 = 52.0%	2 = 22.2%	60 = 58.2%
Dead of carcinoma	12	24	7	43
Dead of intercurrent disease	4	5	0	9
Not traced	1	2	2	5
Total	49	57	11	117
Even if all patients not traced or dead of intercurrent disease are counted as failures there still remain 51.3 per cent living five years after treatment				
All Patients Treated Prior to Five Years Ago by Operation and Postoperative Irradiation				
Alive and well				141 = 52.4%
Dead of carcinoma				125
Dead of intercurrent disease				17
Not traced				24
Total				310
If all dead and untraced patients are counted as failures there still remain 45.5 per cent whose treatment was a success				
All Patients Treated Prior to Five Years Ago by Operation and Preoperative or Postoperative Irradiation or Both				
Alive and well				184 = 51.1%
Dead of carcinoma				176
Dead of intercurrent disease				24
Not traced				23
Total				412
Counting all dead and untraced patients as failures, there remain 44.6 per cent whose treatment was a success				

\* From Dr Pfahler's private records. The total number of patients treated more than five years ago equals 1136.

Two hundred and thirty-three patients with primary carcinoma of the breast treated by irradiation only not included in the present analysis.

Four hundred and ninety-one patients with recurrent carcinoma of the breast after operation treated more than two months after operation and patients with definite recurrence when first seen by us are not included in this analysis.

The five year period in our cases dates from the beginning of our treatment.

have been implanted or transferred are not yet completely adapted to the tissues of the host and while the cancer cell is more radiosensitive than it would be at a later date.

**Results of Treatment**—It is difficult to estimate the results of treatment, because of the difficulties in classification. The technic has been variable, therefore our conclusions must of necessity be open to criticism and skepticism. Portmann<sup>28</sup> has tried to solve this problem by a careful analysis of cases taken from the records of the Cleveland Clinic and has proved that postoperative treatment is of value. However, until some institution with a large amount of material can have a large group of patients carefully studied and classified

before operation, operated on by a standard technic, or at least by equally skilful surgeons, and then treated by equally skilful radiologists with a more or less standard technic, and then wait until five or ten years to estimate results, it will be difficult to draw conclusions that are not open to criticisms. Such criticisms, however, apply to most clinical work. It is often forgotten that an equal amount of variation in skill and technic is found among radiologists as is found among surgeons. After all, the apparatus used by the radiologist corresponds closely to the surgical instruments used by the surgeon, and more depends on his skill and judgment than on the particular instruments that are used.

We are submitting, therefore, a few tables bearing on this subject, made up from a relatively few of the many statistics available. Time and space will not permit of a review or mention of all valuable contributions. Those compiled from recent literature and those made up from our own records must be accepted for what they are worth, but, at least, we as clinical observers are thoroughly convinced of the value of both preoperative and postoperative irradiation.

#### SUMMARY AND CONCLUSIONS

Reviews of records from clinics in different parts of the world and a postoperative study of our 400 cases of carcinoma of the breast belonging to clinical stage 2 treated more than five years ago in which operation took place more than five years ago convince us that postoperative prophylactic irradiation is of definite value.

Such postoperative treatment should begin, when practical, within ten days to two weeks after operation.

Almost every physician has seen recurrent carcinoma of the breast disappear under irradiation. It should be self evident that similar treatment given to the cancer cells before the disease has adapted itself to the host and has become macroscopic should accomplish even better results.

Preoperative irradiation is probably of equal or greater importance. It should be employed within approximately two weeks before operation in cases of carcinoma of the breast in clinical stage 2. Doubtfully operable carcinoma and carcinoma in stage 3 are treated over a much longer time.

The preoperative treatment is intended to devitalize the more malignant cells, which usually cause the surgical failures.

Statistics are not yet available, but we believe that skilful preoperative irradiation, then skilful operation, followed by skilful postoperative irradiation should double the total number of persons with cancer of the breast remaining well five years.

Statistics compiled from the same clinics in which both forms of treatment were used show an improvement of from 11 per cent to 73 per cent when postoperative irradiation is combined with operation as compared with operation alone, according to different authors. Large collections of cases from literature show a 25 per cent improvement.

The average number of persons with carcinoma in stage 2 who survived when treated by operation alone, for a group of the best surgical clinics, is 28 per cent while the general average for postoperative irradiation is 40 per cent. Our results with postoperative irradiation of carcinoma in stage 2 show 52 per cent, and when the cases in which preoperative irradiation was used are added it is 57 per cent.

1930 Chestnut Street

#### ABSTRACT OF DISCUSSION

DR FRANK E. ADAIR, New York. The authors came to the conclusion that the proper way to treat cancer of the breast is by a mild dose of preoperative irradiation followed by radical amputation, and that followed by the postoperative irradiation. I am inclined to think that they are right. At Memorial Hospital we have subjected 250 patients to preoperative irradiation. We started at 1,200 roentgens and raised it up to 2,400 roentgens. The unhappiness about that series was that we could not anticipate which patient was going to have the breast sterilized by the preoperative irradiation and which was not, but when one uses 2,400 roentgens one gets about 100 per cent sterilization of the breast. We do not know what is going to be the outcome and the preferable way of treating these cases. We do not know what to do with a good sized group of cases, sometimes giving 3,400 or 4,000 roentgens. I do not know what that is going to prove, but in the meantime Dr Pfahler, independently of Dr Coutard, has come to the same conclusion. Dr Coutard last week in New York stated that, in the present status of mammary cancer, patients should receive what he called moderate amounts of preoperative irradiation, followed by the radical amputation. The authors show that when surgery alone was practiced the entire group had 25 per cent of five year cures. When postoperative irradiation was added, there was 40 per cent, and with different groups of men it was 52 per cent. But Dr Pfahler is in old hand at this work and he emphasizes the fact that there is a enormous difference between roentgenologists and men who have been at it and know their business. In other words, imagine that the technic throughout America is not too high class. Best of all was when Drs Pfahler and Vastine reported that cures had jumped up to 57 per cent as the result of giving preoperative irradiation, then the operation and then the postoperative radiation treatment.

DR E. E. DOWNS, Woodbury, N. J. There is probably no lesion that the radiologist is called on to treat in which there is more uncertainty as to the best therapeutic procedure than breast cancer. No one in this country today has had a broader experience in treating breast cancer than Dr Pfahler. This paper has been a valuable contribution. The argument that the more malignant the cell the more prone it is to metastasize, and that the more malignant the more radiosensitive it is, justifies preoperative irradiation. My associates and I have treated cases preoperatively, using from 2,200 to 2,400 roentgens to each of three or four ports and waiting from three to six months before performing a mastectomy. Our results have been about the same as Dr Adair's. A number of them have been sterile both in the breast and in the axilla. The breast was more radiosensitive than the axilla. It seems that we have definite evidence in favor of preoperative irradiation. Several years ago I was reporting a number of cases of lung fibrosis, so many that we became suspicious and began to review our autopsies. In all we had fifty-five autopsies on patients with breast cancer who had been treated by irradiation. There were nineteen different x-ray laboratories in the vicinity of Philadelphia which contributed to the treatment of these patients. Thirty-seven of them had x-rays alone, eleven x-rays and radium and seven had radium alone. The technic of the roentgen treatments varied from a total of 10,000 roentgens given in a rather short time to smaller amounts delivered once a month for a year or more. Strange as it may seem, there were only two which showed any evidence of permanent fibrosis that could be attributed to radiation alone. These two cases had been treated by radium applied close to the chest wall. There is no question that irradiation fibrosis will appear if irradiation is given in a too intensive series but I believe that by rational treatment such as Drs Pfahler and Vastine suggest we may give irradiation in cases of breast cancer without fear of permanent harm.

DR GEORGE E. PFAHLER, Philadelphia. I congratulate the Program Committee on this excellent program. I don't mean only today but throughout the sessions. With regard to post-radiation fibrosis in the lungs, I am sure it occurs but I believe that we have not had over 0.5 per cent in our experience. I do not examine every patient every month but I have examined enough every month to make me feel quite certain that we are not having this sort of experience frequently. If

enough radiation is given a fibrosis will result, and if it is given rapidly or if it is given directly through the lungs with high voltage x-rays we are more apt to get it. I am avoiding that as much as possible.

DR U V PORTMANN, Cleveland. In answer to Dr Adair's question I would say that from 1500 B C until 1934 A D the treatment for cancer of the breast was mostly surgical. About the time of Celsus, just about the time of Christ, surgeons experimented with cauterization of tumors and all during that period they did not cure cancer of the breast. Fifteen per cent of their patients lived three years, 5 per cent lived five years, and perhaps some of them would have lived as long as that if nothing whatever had been done for them. In the sixteenth century, operations were advocated which changed the procedure in the one respect that the mass of the breast, pectoral muscles and the axillary contents were taken out in one mass when the cancer justified the operation. The radical operation itself was developed about 1867. The technic was changed in 1934, when prolonged irradiation came into vogue. For the past forty years the average five year surgical curability of unclassified cancers has remained at about 28 per cent.

## RECOVERY FROM GONORRHEAL ENDOCARDITIS AFTER ARTI- FICIAL HYPERPYREXIA

### REPORT OF A CASE

HUGO A FREUND, MD

Chief of the Department of Internal Medicine Harper Hospital

WALTER L ANDERSON, MD

Resident Physician

AND

VERNON S LILLY, MD

Assistant Surgeon Outpatient Department

DETROIT

Gonorrheal endocarditis has long been recognized as a complication of gonorrhea. The gonococcus not only is the causative agent of gonorrhea in the genito-urinary tract but can invade the blood stream to produce arthritis, synovitis, myositis, pericarditis, myocarditis and endocarditis.

The frequency of cardiac complications of gonorrhea cannot be definitely stated, but they are relatively rare considering the universal prevalence of the disease. The literature surveyed by Thayer<sup>1</sup> in 1922, Hoffman and Taggart<sup>2</sup> in 1932, Kirkland<sup>3</sup> in 1932 and Eric Stone<sup>4</sup> in 1934 covers a total of 123 cases. Since 1934 sixteen more cases<sup>5</sup> have been reported in the literature.

- From Harper Hospital  
1 Thayer W S Cardiac Complications of Gonorrhea Bull Johns Hopkins Hosp 33 361 372 (Oct.) 1922  
2 Hoffman A M and Taggart F C Gonococcal Endocarditis Summary of Literature and Report of a Case Ann Int Med 5 1397 1403 (May) 1932  
3 Kirkland H B Gonococcal Endocarditis Case Am Heart J 7 360 370 (Feb.) 1932  
4 Stone Eric Gonorrheal Endocarditis J Urol 31 869 895 (June) 1934  
5 These cases were reported by  
Blondin P Advier M and Rivault A Gonococcal Endocarditis Two Cases Bull Soc path exot 28 234 235 1935  
Stoia I and Stanculescu P Gonococcal Ulcerovaginitis Malignant Endocarditis Rev stant med 22 1383 1386 (Nov.) 1933  
Rucks W W Jr Gonorrheal Endocarditis Case Report with Autopsy J Oklahoma M A 27 55 (Jan.) 1934  
Eakin W W Gonococcal Endocarditis Canad M A J 31 269 272 (Sept.) 1934  
Peters H L and Horan Benjamin Malignant Ulcerative Gonococcal Endocarditis Fatal Five Days After Appearance of Cardiac Involvement J A M A 102 1924 1926 (June 9) 1934  
Ross C W and Graves F C Gonococcal and Meningococcal Endocarditis with Report of Three Cases U S Nav M Bull 33 179 183 (April) 1935  
Cohn Isidor Gonococcal Endocarditis Report of a Case with Positive Blood Culture J A M A 107 1630 1632 (Nov. 14) 1936  
Cann Andre and Cattain Roger Gonococcal Septicemia with Purulent Monoarthritis Meningitis and Endocarditis Recovery of a Case Bull et mem Soc med d hop de Paris 51 1262 1271 (July 22) 1935  
Valek Ivan Gonococcal Endocarditis with Positive Hemoculture Case Casop lek cesk 73 634 635 (June 15) 1934  
Boceri Donato and Salvo Cavetano Gonococcal Septicemia with Endocarditis and Other Complications Two Cases Semana med 2 1831 1834 (Dec. 7) 1935

According to the criteria generally accepted, a patient proved to have gonorrheal endocarditis must have a positive blood culture in vivo or a positive culture or smear from the vegetations at necropsy. We find only 108 proved cases in the 139 reported. In the remainder we assume that the diagnosis was presumptive, probable or possible.

The age incidence of the total series ranges from 2 to 51 years, the average being 26.4 years. The preponderance of males is noted in the ratio of 7 to 3. The average duration of the disease is about ten weeks. Gonorrheal arthritis is reported in 57.7 per cent of the cases.

### SIGNS AND SYMPTOMS

The time of onset of endocarditis cannot be definitely ascertained, but one may assume that gonococcemia has occurred when arthritis appears. Clinically the development of the endocarditis is often obscured by the presence of a complication such as prostatitis, salpingitis or, most frequently, polyarthritis. Endocarditis may not be recognized until signs of the valvular lesion are fully established.

The onset is usually gradual, the constitutional symptoms headache, general malaise and prostration predominating. If sudden, it may be initiated by a sharp chill. The fever is of a high remittent or intermittent type often associated with chills and marked perspiration. Secondary anemia develops rapidly and may be profound, with counts reported as low as 1,500,000. The leukocyte count is usually high.

The patient presents a picture of septicemia with progressive exhaustion. The pulse is usually soft and easily compressed, tachycardia is the rule. Cardiac signs and symptoms may be indefinite in character. The appearance of a murmur during the course of the disease is strong evidence in favor of acute endocardial involvement. The variability from day to day of a murmur, as to both its intensity and its quality, is characteristic. Cardiac dilatation in the absence of chronic valvular disease is usually terminal.

If, in the course of a fever of unknown origin, a murmur due to chronic valvular disease undergoes a change or, in addition to a mitral murmur, an aortic diastolic murmur appears, one should suspect infectious endocarditis. It is notable, however, that gonorrheal endocarditis developed on healthy, previously unaffected heart valves in 91.2 per cent of the cases. Petechiae and embolic phenomena are not infrequent and are due to the formation of vegetations and ulcerations on valve flaps. Case reports describe the occurrence of cerebral, pulmonary, splenic, skeletal muscle, renal and popliteal emboli.

Acute or subacute nephritis is frequently encountered. The intermittent appearance of red blood cells in the urine may be indicative of renal infarction or may be part of a nephritic picture. The spleen may or may not be palpable.

### PATHOLOGY

In gonorrheal endocarditis the lesions are vegetative and ulcerative. The vegetations are usually large and friable, with marked destruction of the valves. In about one third of the cases the vegetations extend on to the wall of the heart, with an occasional extension into the aorta. Thayer<sup>1</sup> reported two cases of vegetative and ulcerative aortitis.

The gonococcus has a predilection for the aortic valve the latter being involved alone in 45 per cent of cases and in combination with the mitral valve in 57.5

per cent. The pulmonary valve is affected more frequently than the tricuspid, the tricuspid valve was involved alone in only one case reported and in combination with other valves in nine cases.

Not infrequently gonorrheal aortitis, pericarditis and suppurative myocarditis are found in addition to the endocarditis. Suppurative myocarditis may appear as a direct extension of the endocardial process or as the result of emboli in the coronary vessels. Myocardial abscess formation has been reported in several cases. Pericarditis has been found in 11 per cent of all cases reported.

#### DIAGNOSIS

The diagnosis of gonorrheal endocarditis depends on a heart lesion developing suddenly in the course of a systemic complication of gonorrhea, such as septicemia or arthritis. An absolute diagnosis cannot be made without a positive blood culture *in vivo* or the recovery of the gonococcus from vegetations or blood at necropsy. A positive blood culture in itself is not definite evidence of endocarditis, for one frequently sees gonococcemia without endocardial involvement. It is undoubtedly true that the gonococcus may appear in the blood stream prior to the development of gonorrheal arthritis and other metastatic forms of gonorrhea. The diagnosis may be obscured by the presence of a chronic valvular disease and may not be detected until the signs of fresh valvular involvement or of embolic phenomena appear. In many instances the condition is not discovered until autopsy.

#### PROGNOSIS

Recovery in an absolutely proved case of gonorrheal endocarditis is extremely rare. A survey of the literature reveals that the mortality rate is 93.5 per cent. The patients who recover have a persistent cardiac lesion.

Only seven of 108 patients who were definitely proved to have the condition survived. The following is a brief summary of each case and of the type of therapy instituted.

CASE 1 (Hicks) — For a man aged 28 who had urethritis, arthritis, septic temperature and systolic murmur at the base. Salicylate and potassium iodide were ineffective. The blood culture was positive. Monovalent gonococcus stock vaccine was given every fourth day for four days, with rapid and marked improvement. The patient was discharged one month later with persistence of a systolic murmur at the apex and of the elevation of temperature. Two years later there were mild recurrent chills attacks with some dyspnea.

CASE 2 (Morrice and Dehne) — A girl aged 10 years who had chills, high fever and a cardiac lesion. Had positive blood culture. Gonococcus vaccine and later meningococcus vaccine were given with eventual recovery.

CASE 3 (Scheffman) — In a man aged 23, who had urethritis, polyarthritis and a cardiac lesion. Pericarditis developed. The blood culture joint fluid and urethral discharge revealed gonococcus. Treatment consisted of intravenous injections of penicillin. The condition cleared was not reported.

CASE 4 (Flaver) — A man aged 28 who had urethritis, septic temperature, rose spots, palpable spleen and a systolic murmur at the base. Had a positive blood culture. The white blood cells numbered 8000. The patient was given 4 grams (102 G.) of quinine sulfate every three hours. He was discharged six weeks after admission completely well. Five years later he was normal except for posterior urethritis.

CASE 5 (Perry<sup>10</sup>) — A man, aged 22, had gonorrheal arthritis, and three months later fever, marked prostration chills and a septic temperature developed. The blood culture was positive. Fourteen blood transfusions of 250 cc. each and one injection of convalescent serum were given. Autogenous vaccine was tried, but severe reactions were encountered. There were four pulmonary emboli. The patient was discharged three months after onset with a persistent diastolic murmur over the pulmonic area. Fourteen months later he was reported well.

CASE 6 (Dieulafoy<sup>11</sup>) — A man, aged 23, who had a positive blood culture and urethral smears, was treated with gonococcus vaccine. The course of the disease was typhoidal. The patient recovered, his condition on discharge was not noted.

CASE 7 (Withington<sup>12</sup>) — A man, aged 26, who had a positive blood culture and urethral smears, had a pneumonic involvement and measles during the course of the endocarditis. The condition on discharge and the type of treatment were not noted.

It is evident that a uniform plan of treatment does not exist. Blood transfusions frequently performed, gonococcus vaccine, antigonococcic serum and dyes administered intravenously have been used when the patient recovered as well as when the patient died.

With the introduction of artificial fever in the treatment of disease, evidence began to accumulate that gonorrheal infections would respond favorably. Many clinics the induction of high temperature over long and continuous periods soon was regarded as of specific value.

Experimentally, Carpenter, Boak, Mucci and Wilcox<sup>13</sup> have shown that 99 per cent of gonococci in culture are rendered nonviable after exposure to temperature of 41.5 C., or 106.7 F., for four or five hours. This fact has become the basis for the treatment of gonorrheal infections and the guide for the maintenance of hyperthermia. Our clinical results in cases of gonorrheal arthritis, urethritis, salpingitis, prostatitis, peritonitis, proctitis and ophthalmia are in accord with the experimental data. It is apparent therefore that artificial fever maintained at a minimum of 106.7 F. for at least five hours has a lethal effect on the gonococcus irrespective of its location in the body.

#### REPORT OF CASE

Realizing that an extremely high mortality exists for endocarditis and septicemia complicating acute gonococcal infections and that high temperature is destructive to the gonococcus, we considered it justifiable to submit a patient severely ill with gonorrheal endocarditis to this type of therapy.

HISTORY — F. S., a Negro woman, aged 20, a student, was admitted to Harper Hospital Aug. 24, 1936, in the care of Dr. Vernon S. Lilly, complained chiefly of a painful, swollen right ankle, extreme weakness and drenching sweats. She was seen in consultation by Dr. Richard E. McKean. The patient stated that she was completely well until July 30, 1936. In her occupation as an elevator operator, she believed she injured her ankle when she kicked the door shut several times. On the following evening slight discomfort in the ankle was noted on walking. The next morning it was swollen. She was unable to bear her weight on it, because of the pain. She remained in bed for the rest of the day, but in the afternoon of this the swelling and pain increased.

She was first seen by a physician on August 2. Examination showed her to be essentially normal except for a painful, swollen right ankle. She was advised to remain in bed.

10 Perry M W. Am J M Sc 179:599 (May) 1919.  
11 Dieulafoy Georges. Internat Clin 19:59 1919.  
12 Withington C M. Boak Ruth A. Mucci L A. J. J. S. I. Studies on the Physiologic Effects of Fever Temperature. J. Clin Med 18:981-999 (July) 1933.

13 Carpenter C M. Boak Ruth A. Mucci L A. J. J. S. I. Studies on the Physiologic Effects of Fever Temperature. J. Clin Med 18:981-999 (July) 1933.



given salicylates. On August 11 the ankle was swollen and very tender to palpation with marked limitation of motion. The temperature was 100 F. There were no other joint pains. The remainder of the examination gave essentially negative results except for a faint, soft blowing, systolic murmur, heard at the apex, not transmitted to the axilla.

A few days previous to admission she noted that about 6 o'clock each evening she would have attacks of profuse perspiration accompanied by elevation of temperature but no actual chill. The temperature would remain elevated for about two hours. Because of the persistence of the condition of

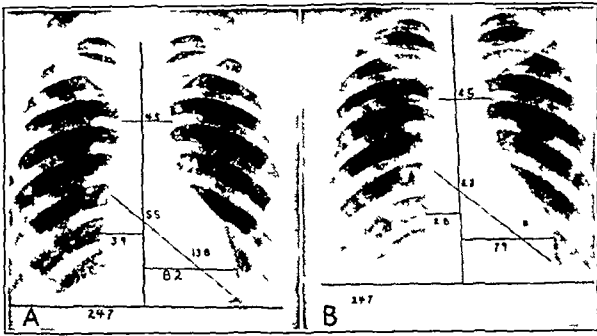


Fig. 1—Orthodiagram A Aug. 25, 1936 B after hyperpyrexia Jan. 13, 1937. Note the decrease in the size of the heart.

the ankle and the daily rise in temperature she was admitted to Harper Hospital on August 24.

Except for measles and mumps in childhood she had had perfect health. There was no history of rheumatic fever, tonsillitis, or venereal disease. During a routine examination in 1934 a soft blowing nontransmitted murmur was discovered at the cardiac apex. There was no history of dyspnea, precordial pain, or cough. The patient had had a tonsillectomy at the age of 12 years and some tonsil tags removed at the age of 14. Catamenia was of the normal type. The family history was unimportant.

**Physical Examination.**—The patient was well developed, well nourished and acutely ill and complained of severe pain on any movement of the right ankle. The skin was moist and warm and no eruptions or petechiae were found. The pupils were equal and regular and reacted normally to light and in accommodation; there was no nystagmus and the conjunctivae were clear. The tonsils were absent and the pharynx was not injected. The teeth were in perfect condition and the tongue was clean. The thyroid was not enlarged and no cervical adenitis was present. The lungs showed good expansion and were resonant throughout; vesicular breathing was normal. Examination of the heart showed that the apex beat was not audible, and on palpation in the fifth intercostal space there was no thrill. The left border of cardiac dullness was 1 cm to the left of the midclavicular line and the right border beneath the sternum; the heart sounds were forceful and the rhythm was regular. A blowing systolic murmur of moderate intensity was heard best at the apex and was well transmitted to the left axilla; a soft blowing systolic murmur was heard at the base. The blood pressure was 138 systolic and 70 diastolic. The liver, spleen and kidneys were not palpable. Pelvic examination was not made at this time. The extremities were normal except for the right ankle which was markedly swollen and very tender to palpation with marked limitation of motion. No fluctuation was present. The reflexes were physiologic.

**Laboratory Examination.**—A blood count showed 7,800 leukocytes per cubic millimeter, with 64 per cent polymorphonuclears, 33 per cent lymphocytes, 1 per cent monocytes and 2 per cent basophils. 3,470,000 red cells and 63 per cent hemoglobin. The urine was normal and the Kahn test of the blood negative. The noncoagulable nitrogen content was 25 mg, the phosphorus content 36 mg and the calcium content 11 mg. The sedimentation rate was very rapid, 29 mm in thirty minutes.

X-ray examination of the right ankle revealed soft tissue swelling about the ankle joint but there was no evidence of destruction of bone or cartilage; the changes being limited entirely to the periarticular tissues. A 7 foot plate of the heart (fig. 1) revealed the following cardiac diameters: transverse 24.7 cm, medial left 8.2 cm, medial right 3.9 cm, longitudinal 13.8 cm and great vessels 4.5 cm. The heart was enlarged about 1 cm in both its medial left and its longitudinal diameter. The index of the auriculoventricular ratio was slightly higher than normal, 0.662, indicating a limited auricular preponderance (Clayton and Merrill scale; patient's weight 110 pounds [50 Kg], height 5 feet 4 inches [162 cm] and age 20 years). The electrocardiographic tracing (fig. 2) was essentially normal except for T which was small and slightly diphasic, and T which was inverted.

**Course.**—A blood culture taken August 25 showed a gram negative diplococcus identified as the gonococcus of Neisser. August 26 the patient was continuing to have a septic temperature, with daily evening elevations accompanied by marked perspiration (fig. 3). Examination of the heart showed an intensification of the systolic murmurs previously described. Cervical smears showed gram negative intracellular diplococci morphologically typical of the gonococcus. August 27 the temperature continued to show marked diurnal variations. The systolic murmur at the apex had definitely increased in intensity. Over the aortic area was a loud rough, blowing, systolic murmur, transmitted up the neck and heard over both carotids but more clearly on the right. The blood culture was again positive for the gonococcus.

August 28 the patient was referred to the department of fever therapy. A third blood culture was positive for the gonococcus. Because of this evidence with the presence of monoarticular arthritis, a definite shifting endocardial picture, a modified picket fence temperature and vaginal and cervical smears positive for the gonococcus a diagnosis of gonorrheal endocarditis, arthritis and cervicitis was made.

August 29 the patient was given five hours of hyperpyrexia in the hypertherm at a sustained temperature of from 106 to 107.4 F. The maximum pulse rate was 130 and the patient took the treatment without untoward effects. August 30 the patient's highest temperature for the day was 99.1 F and there was definitely less pain on motion of the right ankle. The condition of the heart was unchanged.

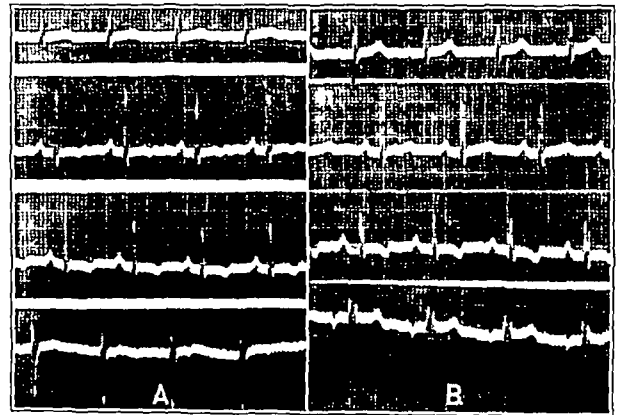


Fig. 2—Electrocardiogram illustrating the improvement in the T waves A Aug. 25, 1936 B after hyperpyrexia Jan. 13, 1937.

August 31 the patient was again given five hours of sustained temperature at 106 to 107 F. In the evening there was considerably less swelling of the right ankle. The heart was unchanged. September 1 the temperature was normal all day. Clinically there was marked improvement but the heart tones were not changed.

September 2 the patient was given a third period of hyperpyrexia with a temperature of from 106 to 107 F for five hours. September 3 vaginal and cervical smears were negative for the gonococcus. The temperature was 99.4 F in the evening.



September 4 the fourth period of hyperpyrexia was given. The systolic murmur at the apex was definitely less intense. The loud rough systolic murmur over the aortic area was of the same quality and intensity. September 5 the temperature was normal all day.

September 6 the fifth period of hyperpyrexia was given. The right ankle was almost normal in size, and there was no

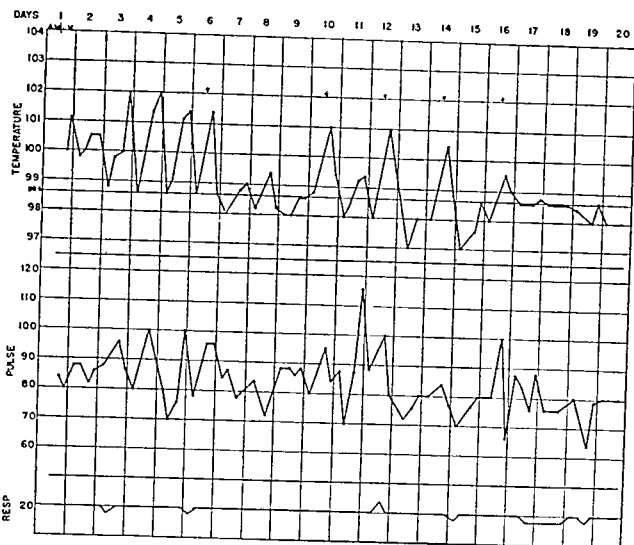


Fig. 3—Clinical course during hospitalization. Asterisks denote fever therapy.

pain on any movement except hyperflexion. September 7 the temperature was normal and blood culture negative.

September 8 the sixth period of hyperpyrexia was given. The patient then had had a total of thirty hours of sustained rise of temperature to from 106 to 107.4 F in five hour periods every other day for six treatments. The blood culture was again negative. A blood culture on September 10, 11 and 12 showed no growth. Cervical smears on September 11 were negative for the gonococcus. During these four days the temperature never exceeded 98.6 F.

On the day of dismissal, September 12, the right ankle was normal, with no pain on forced flexion or extension. Examination of the heart showed a residual soft systolic murmur at the apex transmitted to the axilla. Over the aortic area the loud, rough, blowing systolic murmur persisted, transmitted upward into the carotid vessels. This aortic murmur had decreased only slightly in intensity.

The patient was seen five weeks later. A four hour daily temperature chart kept since discharge showed no rise of temperature. The pulse rate was 76. No change in cardiac murmurs was evident at this time.

Two months later the temperature remained normal. The ankle was symptom free. The character of the apical murmur was unchanged, but the murmur at the aortic area was definitely less loud and rough.

January 13, four months after the discharge from the hospital, when the patient reported to the fever therapy department, there were no complaints of any nature. She had gained 19 pounds (8.6 Kg). Examination of the heart showed no palpable thrill. The diameters of the heart were within normal limits except for a questionable prominence of the left third interspace. There was some reduplication of the first sound at the apex, with a short soft blowing murmur immediately following it, heard over the entire precordium and transmitted to the left axilla. At the base and the right aortic area there was a soft systolic murmur, slightly rougher than that at the apex, transmitted to both carotids but heard best on the right side. The second aortic and second pulmonic sounds were both accentuated but the second pulmonic sound was of a slightly higher pitch. The blood pressure was 112 systolic and 62 diastolic. The pulse rate was 72. A blood culture and cervical smears were again negative. The electrocardiographic tracing was essentially normal.  $T_1$  previously inverted was erect.  $T_2$  remained inverted. A 7 foot

plate of the heart revealed the following diameters: transverse 24.7 cm, medial left 7.9 cm, medial right 2.8 cm, longitudinal 12.8 cm and great vessels 4.5 cm. The auriculoventricular ratio was 0.706. There had been a definite decrease in the size of the heart in all diameters since the previous observation. The blood count showed leukocytes 6,900, polymorphonuclears 50 per cent, lymphocytes 46 per cent, eosinophils 4 per cent, red cells 4,000,000 and hemoglobin 81 per cent. The sedimentation rate was slow, 4.5 mm in thirty minutes.

#### CONCLUSIONS

1 Artificial fever therapy is a method for the successful management of gonorrheal endocarditis.

2 It is recommended that the hyperpyrexia be maintained at 106.7 to 107 F as the optimum temperature for the treatment of gonorrheal endocarditis.

#### PHOTOMICROGRAPHIC MOTION PICTURES

ALBERT S. WELCH, M.D.  
KANSAS CITY, MO.

By means of the motion picture camera using 16 millimeter reversible film and the binocular microscope, good motion pictures of microscopic material may be obtained by the amateur photographer. But little additional equipment is necessary. Preparations for taking the picture must be made with great care. There are three problems to be solved: the light, the focus and vibration.

The following description applies to a certain make of 16 millimeter motion picture camera and one binocular microscope, but the principles laid down should be applicable to machines of other make.

The light from ordinary bulbs or substage lights is insufficient. The lamp with iris diaphragm as used for darkfield work is satisfactory. It should be set up as close to the reflecting substage microscope mirror as it can be focused, usually at a distance of from 6 to 8

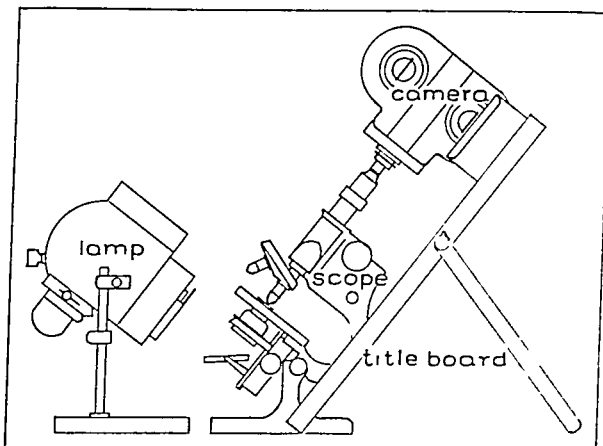


Fig. 1—Arrangement of lamp, microscope and motion picture camera.

inches. The plane mirror is preferable to the convex mirror. A piece of white paper may be placed on the mirror while the light from the lamp is being focused. It is focused by loosening a small set-screw at the side of the lower part of the lamp and moving the bulb thus loosened backward and forward until the image of the filaments on the paper is in focus. During this procedure, the iris diaphragm of the lamp is cut down to its smallest aperture.

With the microscope properly tilted to conform with the arrangement of the camera, as will be described later, the substage mirror is maneuvered while one looks through the low power (16) lens until the small circle of light is exactly centered in the field. The lamp diaphragm is then gradually widened until the circle of light enlarges to cover the entire field. If it does thus evenly, the lamp and mirror are properly arranged. When the pictures are taken, the lamp diaphragm may be opened still wider.

With the oil immersion lens and either the 6× or the 10× eyepiece, the diaphragm in the microscope should be set at 1, which is a little bit wider open than midway. The microscope substage may be slightly lowered if necessary without changing the other light adjustments.

In the setup as just described, so much light will come through the microscope that the eye can hardly see the objects in the field. A blue glass that goes in front of the lamp may be kept in position during focusing but must be removed before the motion pictures are made. It helps to cut down the glare. Another eye-saving device is a small piece of blue glass, about one-fourth inch in diameter, which may be used as a cover to the eyepiece that is looked through.

Having located the field desired to be photographed, one separates the two eyepieces from each other as widely as possible, this will permit of focusing the camera through one eyepiece while leaving the other free to be looked through while the pictures are being taken. Thus whatever is in focus to the observing eye will be in focus simultaneously with the film in the motion picture camera.

When the sunshade of the camera is approximated to the microscope eyepiece so that it almost touches, the proper focus is at once obtained. Sunshade and eyepiece must not touch or the vibration of the camera when in motion will be transmitted to the microscope, and in wet preparations, the particles will dance. A thin streak of light should be visible between sun shade and eyepiece, or a piece of paper should pass easily between the two without binding. An accurately measured distance between the two is not essential and even should they be separated by the thickness of a blotter, the focus will remain good.

Of course the camera and the microscope should be lined up so that the barrel of the one parallels that of the other, and this must be done carefully if the image is to fall in the middle of the frame of film. A title board, stripped of lights and card holder, serves satisfactorily as a stand to hold the camera. The microscope can be bent to conform with the camera angle as noted in figure 1.

Should cameras other than the one described be used, the proper focus may be ascertained by making a cardboard cuff the exact depth of lens to film as measured with dividers. This cuff may be placed over the eyepiece of the microscope and a piece of ground glass laid on it. When the image of the preparation on the slide is focused on the ground glass, it should also be in focus on the film when the camera is placed the same distance away. The cuff may be moved toward or away from the microscope until the proper distance is obtained. Observations must be carried out in a dark room.

Vibration is of concern chiefly in wet preparations. The microscope and the camera should be mounted separately, with no point of contact. The base on

which both rest must be solid. The top of a wooden laboratory table is not satisfactory. A good solid floor, near the wall, may prove satisfactory.

Pictures may be taken either in black and white or in colors. In most instances the colored film is more satisfactory, even though there is little color in the preparation to be photographed. A finer quality picture usually obtains. Superspeed film for artificial light must be used, and the special color film for making pictures by artificial light must be used. The substage microscope diaphragm setting as mentioned is satisfactory for both, although a very little bit more light may be desirable for the colored film.

The camera should be wound tightly before each picture is taken since, unlike ordinary subject matter, it may be desirable to run scenes continuously for



Fig 2—Amebic cyst iron hematoxylin stain showing nuclei at different focal levels in upper frame near cyst center in lower frame about 1 o'clock. Enlargements from 16 mm reversible film by Hanley's Photo Company, Kansas City.

twenty or thirty seconds. One person watches through the microscope, keeping his subject centered in the field and in focus, while another pushes the button on the camera. Before each scene, the camera should be carefully realigned with the microscope eyepiece.

Pictures of various material taken from time to time as the opportunity presents itself may be edited and given a main title, and sound may be supplied by a professional sound engineer. The sound adds immeasurably to the value of the presentation. Many radio broadcasting stations have sound-recording laboratories where sound-on-record of exceptionally good quality may be obtained for no more than titles would cost. Before the recording, however, a script should be prepared. This is done while running the pictures over and over again until the proper kind and number of words to be used are written down. Impromptu

descriptions are never as good as prepared scripts and the quality of pictures and sound obtained demand good description

If a single phonograph is to be used about a twelve seconds interval must be allowed for the changing of records. Any good motor-driven phonograph with electrical pick-up and variable amplification will reproduce satisfactorily. If it has a heavy head, one of proper weight for acetate records may be purchased and installed for about \$7.

When the records are made, the script is read into the microphone while the pictures are projected. When played later, the speed of the motion picture projector is regulated to synchronize with the sound from the record since any change in the speed of the record would alter the quality of the voice.

Although perfect synchronization is not as attainable in this manner as with sound-on-film, it is entirely satisfactory for purposes of description and special sound effects may be added. The sound-on-film requires a special projecting apparatus and there is

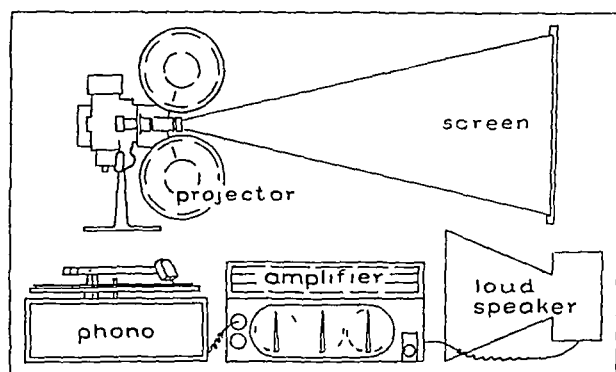


Fig. 3—Arrangement of projector and sound reproducer

considerably more expense involved in making the pictures. Furthermore as yet it is almost impossible to get sound-on-film with colored motion pictures.

#### CONCLUSIONS

Good motion pictures in colors of subjects seen under the oil immersion microscope lens may be obtained with but little more equipment than the average amateur motion picture photographer now possesses.

The procedure is not complicated.

Good sound effects may be added for no more than ordinary titles would cost with the aid of an electric phonograph and loud speaker.

919 Rialto Building

**No Improvement in 25,000 Years**—Such an examination would not show a single improvement in man's anatomical status during the last 25,000 years as revealed by the skeleton. The brain has not increased its size (if anything it has become smaller); the spine has not improved its curves; the pelvis with its weak sacro-iliac joint and its wide-open aperture is still the same unsatisfactory mechanical compromise. The bones of the lower extremity in civilized city-dwellers have indeed become somewhat more massive and better adapted for supporting the body weight in standing and walking over level surfaces; and the feet are perhaps a little larger and stronger but oftener broken down and misshapen. On the other hand our reviewer of skeletal evolution would find certain clear evidence of anatomical degeneration—Hooton E. A. *Apes, Men and Morons*, New York: G. P. Putnam's Sons, 1937, page 291.

## "NORMAL EXPECTANCY" IN THE EXTREMELY OBESE PREG- NANT WOMAN

HARVEY B. MATTHEWS, M.D.  
AND

MAURICE G. DER BRUCKE, M.D.  
BROOKLYN

Obesity is a well recognized pathologic entity. Pregnancy although looked on as a normal physiologic function must be carefully guided through the various pitfalls of an uncertain antepartum course. Individually these conditions are treated according to well established principles. In combination they form a dangerous alliance which calls for constant vigilance. To borrow a famous colloquial expression "Let's look at the record."

This report is based on a study of 200 pregnant women all of whom weighed more than 200 pounds, or 90 Kg. (table 1). During the period of this investigation from April 1932 to October 1936, there were 6,025 deliveries in the Coney Island Hospital. This gives a ratio of one obese patient to every thirty deliveries.

#### ANTEPARTUM OBSERVATIONS

That we were faced with a definite problem in antepartum care soon became a certainty. As pregnancy progressed, more and more complications were encountered. Edema, albuminuria, hypertension, headache and dizziness were most frequently in evidence.

**Pelvic Measurements**—The pelvic measurements of 133, or 66.5 per cent, were within the normal. Fifty-four, or 27 per cent, had just major pelvis. Therefore 93.5 per cent had ample pelvic measurements. One per cent had generally contracted pelvis and 0.5 per cent simple flat pelvis, and in 5 per cent for various reasons the measurements were not tabulated. The pelvis apparently were no great cause for anxiety.

**Albuminuria and Hypertension**—Examination of the urine turned out to be most important for here we met with the first annoying sign. Seventy or 35 per cent had albuminuria, the urine showing from a trace to 4 plus reaction. Nine, or 4.5 per cent, had glycosuria.

Hand in hand with albuminuria and glycosuria went their "bedfellow," hypertension. Seventy, or 35 per cent, of the series had a rise in systolic pressure above the safety limit (table 2).

**Edema**—Edema, particularly of the lower extremities, was present in eighty-seven, or 43.5 per cent, of the cases. This was the most frequent positive finding.

**Other Signs and Symptoms**—Other toxic symptoms that made their appearance were headache and dizziness in forty-one cases, or 20.5 per cent; gastro-intestinal disturbances in 10 per cent; visual disturbances in 8 per cent; nervous manifestations in 4.5 per cent; and clonic convulsions in 2 per cent. Syphilis was present in only 2 per cent.

From the foregoing data it is quite apparent that this series of obese pregnant women began with a 35 per cent handicap. For example, every third patient had evidence of some degree of toxemia; two of every five had edema and one of five suffered from headache, dizziness and weakness.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.

## INTRAPARTUM OBSERVATIONS

These patients having weathered their antepartum period more or less successfully, 93 per cent having ample pelvic measurements, serious intrapartum complications should have been materially reduced. However a thorough study of the details of their intrapartum history reveals that not all was well with the delivery.

**Presentation and Position**—Abnormal presentation and position occurred in somewhat more than 26 per cent of the cases. The details are tabulated in table 3.

**Duration of Labor**—Obviously, with such a large number of malpositions, labor was prolonged. However, malposition was not the only factor operating to prolong the labor. Frequently there was definite uterine inertia, labor pains coming at long intervals and being of such short duration and poor intensity as not to disturb the patient (table 4).

**Operative Incidence**—As was to be expected, the operative incidence (20 per cent) was considerably increased. At first glance, by comparison with the operative incidence in other obstetric services, this figure is not too large. The operative incidence for the total number of deliveries during the same four and one-half year period was approximately 4.5 per cent (table 5).

**Perineum**—Although lacerations made up 26.5 per cent of the total injuries to the perineum, there were no third degree tears. The term tears perhaps gives the

TABLE 1—Age, Height, Weight

	Number	Age		Height		Weight	
		Youngest	Oldest	Shortest	Tallest	Lightest	Heaviest
Multiparas	136	20	44	47"	59"	100	Over 300
Primiparas	54	18	41	47"	58½"	200	Over 300

TABLE 2—Albuminuria and Hypertension

Albumin	No.	Percentage	Blood Pressure		No.	Percentage
			Systolic	Diastolic		
Trace	10	7.5	140-150		26	13
1 plus	20	12.5	150-160		14	7
2 plus	18	9.0	160-180		20	10
3 plus	4	2.0	180-200		6	
4 plus	8	4.0	Over 200		4	2
Total	60	30.0	Total		70	30

TABLE 3—Presentation and Position

Presentation and Position	Number	Percentage	
		Normal	Abnormal
Left occipito anterior	106	24	
Right occipito anterior	40	21.2	
Occipitoposterior	1		1.2
Breech	16		1.5
Transverse			1.5
Mentum	3		1.5
Total	207	7.6	26.2

Two sets of twins

impression of severe trauma, whereas many small lacerations resembled a simple superficial parting of the tissues (table 6).

## WEIGHT OF BABIES

Of the babies 57.5 per cent weighed over 3,600 Gm. The largest weighed 5,170 Gm. Subsequently one of this series of parturients returned to our clinic and was delivered spontaneously of a 5,500 Gm infant after a

three hour and forty minute labor. This patient had postpartum eclampsia. She had no antepartum care.

## COMPLICATIONS

The toxemias of pregnancy accounted for the largest number of complications having affected eighty-nine,

TABLE 4—Labor

	1st Stage	2d Stage	3d Stage	Total
Average labor				
Multipara	12 hours 6 minutes	28 minutes	10 minutes	13 hours 40 minutes
Primipara	29 hours 1 minutes	2 hours 17 minutes	21 minutes	31 hours 30 minutes
Shortest labor				
Multipara	1 hour 3 minutes	7 minutes	18 minutes	1 hour 30 minutes
Primipara	2 hours	20 minutes	10 minutes	2 hours 30 minutes
Longest labor				
Multipara	60 hours	3 hours 24 minutes	2 minutes	63 hours 26 minutes
Primipara	87 hours	1 hour	10 minutes	88 hours 10 minutes

TABLE 5—Operative Incidence

Method	Number	Percentage
Forceps	14	7.0
Low	7	
Mid	5	
High	2	
Breech extraction	7	3.5
Version and extraction	4	2.0
Cesarean section	3	1.5
Bagging (twice in conjunction with other procedure)	3	1.5
Manual removal of placenta (three times in conjunction with other procedure)	7	3.5
Embryotomy and extraction	1	0.5
Rupture of varix in vulva	1	0.5
Total operative incidence	40	20.0

TABLE 6—Perineal Injuries

Type	Number	Percentage
Episiotomy	20	12.5
First degree laceration	42	21.0
Second degree laceration	11	5.5
Third degree laceration	0	

or 44.5 per cent, of the total number of patients. Thirty-three, or 61 per cent, of the total number of primiparas and fifty-six, or 38.3 per cent, of the total number of multiparas made up this group.

The less severe forms, such as low reserve kidney numbered forty-one, or 45.3 per cent of the toxemias. The patients affected exhibited hypertension (from 140 to 180 systolic), albuminuria and edema.

Preeclampsia claimed ten (11.3 per cent). These included patients with hypertension, albuminuria, headache, visual disturbances, epigastric distress and edema.

Eclampsia occurred in five (5.6 per cent). Besides the foregoing symptoms of toxemia these women had one or more convulsive seizures.

Nine patients (10 per cent) had unclassified hypertension. Chronic nephritis occurred in ten others (11.3 per cent). In each case the condition was proved by various tests of the renal function.

Cardiovascular disease affected another ten (11.3 per cent), diabetes three (3.4 per cent) and associated thyroid disturbance one (table 8).

Postpartum hemorrhage sufficient to warrant treatment occurred fourteen times or in 7 per cent. Only a few patients needed transfusion as we feel that only those who have lost 500 cc or more require it.

There was one case each of ruptured varix of the labium hypochromic anemia, twisted ovarian cyst, toxic psychosis, placenta praevia and uteroplacental apoplexy

#### MATERNAL MORBIDITY

The standard of maternal morbidity used was that laid down by the American College of Surgeons, viz., a temperature of 100.4 F on two consecutive postpartum days not counting the day of delivery. There was an uncorrected morbidity in twenty-four, or 12 per cent, of these cases. Eight patients had sapremia, six acute endometritis, two acute pyelitis and one each infection of the upper respiratory tract, acute follicular tonsillitis, acute pharyngitis, acute bronchitis, acute mastitis, acute cystitis, abscess of the right leg with suppurative inguinal adenitis and infection of the episiotomy wound.

#### MATERNAL MORTALITY

There were two deaths.

Mrs. A. T., aged 26, a primipara, height 5 feet (152 cm), weight 204 pounds (92 Kg) had her last menstrual period Oct. 19, 1934. The estimated due date was July 26, 1935. Aside from slight edema of the ankles, the antepartum course was normal. The measurements were intercrural 27 cm, interspinous 25 cm, external conjugate 21 cm, diagonal conjugate 12.5 cm and bischial 9 cm. X-ray examination June 20 disclosed a single fetus, breech presentation. The patient was admitted to the Coney Island Hospital August 21 at 7:30 p. m., not in labor. X-ray examination the following morning showed the breech to have been replaced by the vertex.

The X-ray appearance suggested a disproportion. August 23, two days after admission she apparently began to have some labor. The pains were infrequent, with long intervals between uterine contractions. The following day the cervix had dilated to 3 cm. The presentation was left mentum posterior, and the uterine contractions were still of poor character. In view of the definite uterine inertia and the malposition with probable disproportion and no progress a low two flap section was done under local infiltration anesthesia. The infant weighed 7 pounds 7 ounces (3,373 Gm).

Aside from a great deal of soft abdominal distention the mother apparently had no discomfort. She expelled flatus freely. Her postpartum course was

Hospital October 14, moribund, and died the next day. From the family it was learned that she had generalized edema with her first pregnancy. In her second and third pregnancies she aborted at three months and one month, respectively, and she had had an oophorectomy. Her present condition had begun about three months earlier, with progressive edema involving the upper and lower extremities, the body and the face, and was associated with headache, dizziness, visual disturbances, epigastric pain and vomiting. These symptoms all became worse in the last three or four days, culminating in several convulsions and in cessation of fetal movements. On admission the patient was stuporous and her breathing stertorous. Her blood pressure was 168 systolic, 108 diastolic and shortly rose to 194/90. The urine showed a 4 plus reaction for albumin and numerous white cells, red cells and coarsely granular casts. Chemical examination of the blood showed urea nitrogen 17.6 Gm, uric acid 5.6 mg and dextrose 87 mg per hundred cubic centimeters. The carbon dioxide combining power was 32 volumes per cent. The urea clearance was 43.3 per cent. The patient became restless despite sedatives and toxemic treatment. The membranes ruptured spontaneously, the cervix dilated rapidly and she was delivered of a 6 pound 12 ounce (3,062 Gm) stillborn fetus. She continued in her comatose state and died soon after delivery.

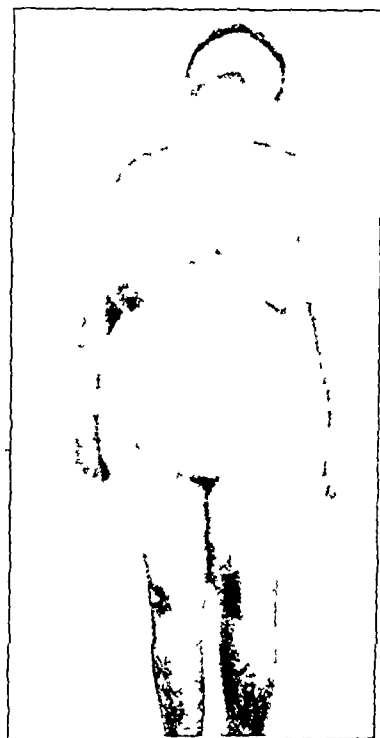


Fig. 2—Decipara aged 34, height 5 feet 5 1/2 inches (166 cm), weight 225 pounds (102 Kg), blood pressure 140 systolic, 80 diastolic, twenty-seven hour labor, transverse presentation, prolapsed cord and arm delivery by version and extraction of a still born infant. Result good for mother.

dilated rapidly and she was delivered of a 6 pound 12 ounce (3,062 Gm) stillborn fetus. She continued in her comatose state and died soon after delivery.

#### FETAL MORTALITY

Of the 202 infants born, twenty-five, or 12.3 per cent, died (table 9).

*Antepartum Deaths* (eight).—In the antepartum period, toxemia caused two deaths and was a contributing factor in another. In one case there was

TABLE 7—Weight of Babies at Birth

Grams	Pounds	Number of Babies	Percentage of Total
Under 2,200	Under 5	5	2.5
2,200-2,700	5-6	7	3.5
2,700-3,100	6-7	21	10.5
3,100-3,600	7-8	52	26.0
3,600-4,000	8-9	63	31.0
4,000-4,500	9-10	36	18.0
4,500-5,000	10-11	16	8.0
5,100	11+	1	0.5

also a knotted cord. Diabetes accounted for one death. In four cases the cause of death was unknown. In three of these the fetus was macerated at delivery, and in the fourth it was apparently a normal 5 month premature fetus. It would seem that closer cooperation between patient and doctor might have prevented the majority of these antepartum fatalities.

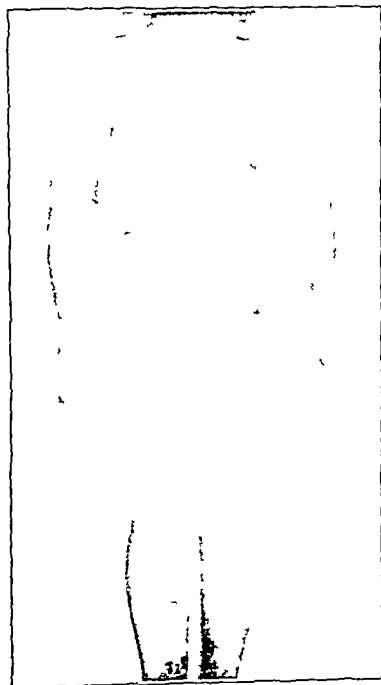


Fig. 1—Secundipara aged 26, height 5 feet 4 1/2 inches (164 cm), weight 255 pounds (115 Kg), edema of the ankles, blood pressure from 130/90 to 170/110, medical induction of labor. Result good for mother and child.

otherwise uneventful. On the seventh postoperative day she suddenly shot a pulmonary embolus, dyspnea, cyanosis, terminal pneumonia and cardiac failure developed and she died within twelve hours.

Mrs. V. D., aged 30, a multipara weighing 270 pounds (122 Kg) had her last menstrual period Jan. 30, 1935 and the estimated due date was Nov. 6, 1935. The patient had no antepartum care. She was admitted to the Coney Island

**Intrapartum Fatalities** (eleven) —Intrapartum deaths made up 44 per cent of the fetal mortality. Malposition may have been a contributing factor in seven of the eleven cases. There were two transverse presentations, one in association with prolapsed cord and arm and the other with prolapsed cord and marginal placenta praevia. Breech extraction accounted for two other deaths. One of the fetuses weighed 11 pounds 6 ounces (5,160 Gm) and the other 9 pounds 6 ounces (4,252 Gm). Midforceps delivery accounted for three deaths, the fetuses weighing, respectively, 7 pounds 13 ounces (3,544 Gm), 8 pounds 12 ounces

TABLE 8—Distribution of Toxemias

Toxemias Classified	Multiparas	Primiparas	Percentage of All Toxemias
Low reserve	24 (16.4%)	17 (31.0%)	40.3
Preeclampsia	3 (2.0%)	7 (13.0%)	11.3
Eclampsia	4 (2.7%)	1 (1.8%)	5.6
Hypertension	6 (4.1%)	3 (5.7%)	10.0
Chronic nephritis	10 (7.1%)	0	11.3
Cardiovascular disease	6 (4.1%)	4 (7.4%)	11.3
Diabetes	2 (1.4%)	1 (1.8%)	3.4
Thyroid disease	1 (0.6%)	0	

(3,969 Gm) and 10 pounds 8 ounces (4,763 Gm). The third measured 58 cm in length and had a bisacromial circumference of 40 cm, a suboccipitobregmatic of 35.5 cm and an occipitofrontal of 35 cm.

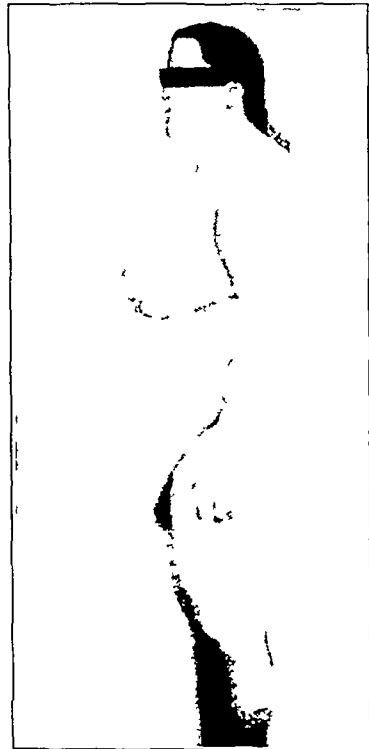


Fig 3—Nonipara aged 41, height 5 feet 2 inches (157 cm), weight 223 pounds (101 kg), thirty-five week gestation, reaction for albumin 2 plus a few hyaline casts in the urine, blood pressure 170 systolic 120 diastolic, moderate sclerosis of the vessels of the eyes, edema of the hands and feet. A stillborn macerated fetus was delivered at term and there was a tight knot in the cord. Mother recovered.

room privileges might have saved one of the infants, who died because of prolapsed cord. The membranes ruptured while the mother was sitting on the toilet, the cord immediately prolapsed and the baby died before replacement of the cord could be accomplished.

Toxemia was the cause of death in two cases, both infants died during an eclamptic seizure. One stillbirth was due to intracranial hemorrhage, resulting from prolonged labor with the fetus in a right occipitoposterior position. The eleventh death was that of a postmature infant weighing 10 pounds 6 ounces (4,706 Gm) who was stillborn after a very difficult midforceps delivery. The cord was wrapped several times around the neck, deflecting the head. Better antepartum care might have prevented one or more of the stillbirths. Earlier intervention and perhaps measures other than mid and high forceps delivery might have reduced the mortality. Restriction of bath-

**Neonatal Deaths** (six) —One death was due to pyloric stenosis. The mother, an unmarried girl, refused proper treatment for this baby. A 2 pound 8 ounce (1,134 Gm) premature infant lived thirty-two hours. Two infants were born of preeclamptic and eclamptic mothers and died within twenty-four hours. Another died within forty-eight hours of cerebral hemorrhage after breech extraction. One died after an easy spontaneous delivery. With a better understanding of pregnancy in the obese, perhaps several of these babies could have been saved.



Fig 4—Sextipara aged 38, height 5 feet 2 3/4 inches (159 cm), weight over 300 pounds (136 kg), albuminuria, blood pressure 164 systolic 96 diastolic, edema of the extremities, medical induction of labor, weight of infant 10 pounds 13 ounces (4,905 Gm). The patient returned in one year was delivered in three hours of a 12 pound 2 ounce (5,500 Gm) baby and had a postpartum convulsion, the blood pressure was 200 systolic 120 diastolic. Mother survived.

SUBSEQUENT PREGNANCIES

During the four and one-half year period of this study, eleven of the parturients returned for a second and one for a third delivery. Generally speaking, subsequent pregnancies appeared on the less favorable side of the ledger, as the pathologic lesions occurring during the first pregnancy were present during subsequent pregnancies and in a few instances aggravated (table 10).

MANAGEMENT

Obviously the obese pregnant woman presents quite a problem. Various degrees of toxemia, malposition and malpresentation, prolonged labor, uterine inertia, exhaustion, postpartum hemorrhage, increased maternal morbidity and mortality and increased fetal mortality

TABLE 9—Fetal Mortality

Antepartum 8		Intrapartum 11		Neonatal 6	
Toxemia	2	Eclampsia	2	Toxemia	1
Knotted cord	1	Prolapsed cord (both in transverse position)	2	Prematurity	1
Maceration	3	Breech extraction	2	Pyloric stenosis	1
Prematurity (5 mos)	1	Mid forceps delivery	3	Cerebral hemorrhage following breech extraction	1
Diabetes	1	High forceps delivery	1	Unknown (easy delivery)	1
		Prolonged labor (intracranial hemorrhage)	1		

are apt to be present. How then shall the pregnancies of these unfortunate women be managed? We suggest the following measures:

1. The women should be seen early and often in their pregnancy.
2. Even though there may be no objective or subjective sign or symptom of toxemia, they should be treated as already having mild toxemia. Their diet, exercises and personal hygiene should be closely scrutinized and carefully planned and carried out.

- 3 When possible, malposition or malpresentation should be corrected before labor begins
- 4 It is frequently advisable to supplement the clinical diagnosis of position, presentation and size of the fetus and of the pelvic measurements with complete x-ray examination
- 5 In cases of unrelenting toxemia the fetus should be delivered as soon as compatible with fetal life, medical induction being indicated whenever possible
- 6 When malposition and malpresentation further complicate the picture, prolonged labor with uterine inertia, maternal exhaustion and increased fetal distress usually supervene and are not infrequently followed by postpartum hemorrhage. A reasonable test of labor should be given, and if there is no progress cesarean section should be performed
- 7 When the obstetrician is finished, the obese woman should be referred to the internist for continued observation, since she presents many pathologic lesions of prime importance

TABLE 10—Subsequent Pregnancies

First Pregnancy	Second Pregnancy	Third Pregnancy
Normal	Normal	
Low reserve kidney blood pressure 164/96 trace of albumin, edema	Postpartum eclampsia blood pressure 200/120	
Preeclampsia neonatal death	Blood pressure 138/96 no other symptoms normal delivery	
Diabetes stillbirth macerated fetus	Diabetes stillbirth macerated fetus	
Postpartum hemorrhage transfusion recommended	Anencephalic monster	Normal
Mild toxemia	Normal	
Edema and headache	Edema and headache	
Normal	Normal	
Normal	Normal	
Ruptured varix	Normal	
Mild toxemia	Normal	
Mild toxemia	Mild toxemia	

SUMMARY

Two hundred pregnant women each weighed 200 pounds (90 Kg) or more. One of the earliest warning signals was albuminuria, present in more than one third of the cases. Closely allied with it was hypertension while two out of five of the women also had edema. The toxemias of pregnancy were therefore the most frequent complication. Furthermore malposition complicating an already troublesome situation was present in every fourth case. Obviously since in so large a number malposition or malpresentation was present or both, the average time of labor was prolonged. With malposition, prolonged labor and aggravation of maternal symptoms and fetal distress, operative intervention was markedly increased—from 4.5 per cent to 20 per cent.

Of the postpartum complications, hemorrhage was the most frequent occurring in 7 per cent of the cases. The morbidity of 12 per cent was approximately three times the uncorrected morbidity for the service as a whole, 3.9 per cent.

There were two maternal deaths: one due to an embolus and one to eclampsia. In the latter case the patient was moribund on admission. Such accidents are obviously beyond the control of the attending obstetrician.

The fetal mortality was unduly high: 12.5 per cent. This rate might have been considerably reduced by a better understanding of the physiology of pregnancy in the obese woman. Both the patient and the doctor may well share the responsibility.

CONCLUSIONS

- 1 Pregnancy in the extremely obese presents many unusual problems and should therefore be more adequately studied
- 2 Throughout pregnancy in the obese, particularly during the early months, special attention should be directed to those organs most vulnerable to disorganized function, i. e., the kidneys, the liver and the heart
- 3 From the very beginning of pregnancy obese women should be treated as potential "trouble makers," since in this series 75 per cent of the women had some type of complication
- 4 Since in 26 per cent of this series there was some type of malposition, early recognition and reasonable attempts at correction should be instituted
- 5 In the obese, prolonged labor is the rule. Therefore the physician should be prepared to manage such labor properly
- 6 With the conviction that the "normal expectancy" for the extremely obese pregnant woman is less secure than for her more fortunate sister, the physician must deliberately plan his mode of action early in the pregnancy, in order to lessen maternal morbidity and mortality and save the lives of more babies

643 St. Marks Avenue—901 Washington Avenue

ABSTRACT OF DISCUSSION

DR. NICHOLSON J. EASTMAN, Baltimore: It is well known from longevity tables and other sources that obesity is always a menace to health. In keeping with this general truth there can be no doubt that obesity in the pregnant woman is a definite handicap. My experience is similar to that reported by Drs. Matthews and Der Brucke, namely, that the expectant mother who weighs over 200 pounds (91 Kg) faces two main hazards: the first is the likelihood of toxemia, the second the probability of an oversized child. Of the infants reported in this paper, some 8 per cent weighed over ten pounds (4.5 Kg). Since the incidence of such large children does not ordinarily exceed 1 per cent, this means that these obese women have oversized infants eight times as frequently as does the average gravida, and it is these oversized babies which are in large part responsible for the high fetal mortality in the group. It may be recalled that in general the mortality of new born infants weighing over 10 pounds is about 15 per cent. When a woman comes to me with a history of having had oversized infants, particularly if she is obese, I have recently carried out sugar tolerance tests and have been surprised to find how often women of this type show curves which tend toward the diabetic. Two such women subsequently developed frank diabetes. Accordingly, I should like to add to the regimen recommended by Drs. Matthews and Der Brucke the employment of the sugar tolerance test in the study of these patients. If this is done, it will be found I believe that a certain number of these women have subclinical diabetes, that is a derangement of their carbohydrate metabolism, which is probably responsible both for their own obesity and for the overgrowth of their infants. Three of the 200 patients just reported had definite diabetes, an incidence of 1.5 per cent; this frequency is surely several times greater than one would commonly expect among pregnant women. The authors of this paper have rendered an important service in reminding us that these obese women face particular hazards in pregnancy and labor and so deserve our particular attention.

DR. JENNINGS C. LITZENBERG, Minneapolis: As far as I know this is the largest collection of cases in one clinic, detailing the complications which arise in the obese woman. Every one knows that the excessively fat woman has trouble in labor. Every one knows that she has troubles in pregnancy, but this paper has given more details and shown more definitely the complications occurring in the obese pregnant woman than any other with which I am acquainted. The authors have shown that an obese woman starts out with at least a 35 per cent handicap at the beginning of her pregnancy. The per-

centages of complications mentioned in this paper are amazing. We consider in our clinic that every fat woman is a pathologic case and consider her potentially an endocrine problem. Instead of treating the obese woman after we have carried her through a stormy pregnancy and sometimes a tragic delivery, we call in the internist or the endocrinologist at the beginning of the case. No fat woman comes to us pregnant without having her basal metabolism taken and without an internist examination, including endocrine studies. Therefore, we began our treatment at the beginning of pregnancy. I should like to ask the authors whether they made any attempt in these women to evaluate the fat distribution in its relation to possible endocrine problems, such as Frohlich's syndrome.

DR HARVEY B. MATTHEWS, Brooklyn. In answer to Dr. Litzenberg's question about the fat distribution and its relation to the endocrines, from the slides shown it is quite apparent that fat distribution in these women is pretty general over the entire body, with perhaps more often larger amounts about the hips, abdomen and breasts. It has already been stated that 30 per cent of these women start out with a handicap. One of these handicaps is the pendulous abdomen that is nearly always present. The pendulous abdomen has a tendency to produce malposition of the fetus. As the abdomen falls forward the axis of the fetal ovoid comes to lie at right angles to the inlet of the pelvis instead of perpendicular to it. Hence when labor begins, the misdirected force renders engagement difficult or impossible. Of these women, 26.2 per cent had malpositions and the pendulous abdomen was one of the major causes. As we brought out the time to treat these malpositions is before labor begins, during the antepartum period. Replacement with proper abdominal support is what should be aimed at, such support to be worn constantly until labor begins. During labor a tight abdominal binder is indicated. Lastly it has been difficult to reduce the weight of these obese women to an appreciable degree. Furthermore their babies as has been shown are generally large—over 3,600 Gm.

## THE BIRTH OF SIX PAIRS OF FRATERNAL TWINS TO THE SAME PARENTS

A DISCUSSION OF THE POSSIBLE SIGNIFICANCE OF SUCH CASES IN THE LIGHT OF SOME RECENT OBSERVATIONS

WILLIAM WALTER GREULICH, PH.D.  
NEW HAVEN, CONN.

The literature contains numerous reports of women who have had a large number of multiple births. Probably the most frequently cited is that mentioned by Geissler<sup>1</sup> concerning Mary Austin, who, during thirty-three years of married life, is said to have borne forty-four children, thirteen pairs of twins and six sets of triplets. One sister of this mother is reported to have had twenty-six children and another forty-one. In addition to what must have been her principal occupation, Mary Austin apparently found time to acquire a doctor's degree.

An even more remarkable case is that reported by Boer<sup>2</sup> of a Viennese woman who bore thirty-two children in eleven births. In the third month of her twelfth pregnancy her abdomen was described as being as large as that of a normal woman at term. This reference to the size of her abdomen suggests that she was well on the way to an even more prodigious accomplishment, but though I have searched the literature carefully I

have been unable to learn the number of children resulting from her twelfth pregnancy. Ahlfeld<sup>3</sup> was of the opinion that some features of this case had been deliberately exaggerated in order to arouse the sympathy of the Viennese for the poor woman. If it is further considered that, according to the report, the father was a twin and the mother a quadruplet and that her mother had thirty-eight children, the apocryphal character of at least some features of the case becomes fairly obvious.

It is necessary to regard reports of such cases with a certain amount of skepticism, because of the unreliability of the evidence on which they are sometimes based. A factor which must always be considered in the history of previous twinning is the tendency of some people to exaggerate any slight claim to distinction. An interesting case in point is cited by Freund<sup>4</sup> and concerns a Silesian woman who preserved her five successive abortuses and, when the sixth one had arrived, mustered the lot and proclaimed them to the world as sextuplets.



Fig. 1.—Marguerite, the surviving member of the oldest twin pair. The deceased twin was a boy.

Since the case of Mary Austin and that of the Viennese woman described by Boer are still cited in modern textbooks of obstetrics, and since no similar recent cases have been added, it would appear that such phenomenal fecundity has become a lost art. It is therefore somewhat reassuring to be able to report a case of more recent occurrence which, though involving a much smaller number of twin births, is unique in that all of its pertinent aspects have been carefully verified.

The case which I report is that of Mrs. H. F., to whom a sixth pair of twins was born on June 12, 1937, at Putnam, Conn. Dr. Joseph N. Perreault of Danielson, Conn., the attending physician, arranged my interview with the family and Drs. Robert C. Paine of Thompson and John J. Russell of Putnam supplied helpful information about the mother's previous twin births. The parents are both native New Englanders of relatively old Yankee stock, the mother was 35 and the father 37 when the last pair of twins was born. In the accompanying table are listed the sex and age of all the children born to these parents. These births have been verified from the records of the bureaus of vital statistics of Massachusetts and Connecticut, in which states they occurred. The male member of the oldest pair of twins died soon after birth, but all of the other twins are living and their photographs are reproduced in the accompanying illustrations.

A striking feature of the present case is that all the twin pairs appear to be fraternal. As may be seen from figures 2, 3 and 5 the two members of each pair of like-sexed twins are too dissimilar to be considered

From the Department of Anatomy and the Adolescence Study Unit, Yale University School of Medicine.

<sup>1</sup> Geissler, A. Zur Kenntnis der Geschlechtsverhältnisse bei Mehrlingsgeburten. Allgemeines statistisches Archiv von Dr. Georg von Mayr, vol. 4, 2d half, pp. 537-544, 1896.

<sup>2</sup> Cited by von Neugebauer, F. Kasuistischer Beitrag zur Frage der ungewöhnlichen Fruchtbarkeit des Weibes. Zentralblatt für Gynäk., 29, 1061-1065, 1913.

<sup>3</sup> Freund cited by Nyhoff, C. C. Verhandlungen der Gesellschaft für Geburtshilfe u. Gynäk. zu Berlin 71. Jahr f. Geburtsh. u. Gynäk., 52, 173-179, 1904.



monozygotic The members of pair 3, who are shown in figure 3, bear a closer resemblance to each other than do the members of either of the other two like-sexed pairs, but the differences even in this pair as to such characters as color of the eyes, form of the head and face and shape of the teeth are definitely greater than



Fig 2—Della and Clara

would be the case if the twins were identical The fact that each member of the like-sexed pairs had a separate placenta supports this diagnosis The unlike-sexed pairs are of course presumed to be fraternal

The only history of previous multiple births in the present case is on the father's side, his father had triplets by a second wife Mr H F has three siblings his brother has two children and each of his two sisters

*Name and Date of Birth of All Children Born to These Parents*

Name	Date of Birth
Stillborn boy	12/ 6/24
Marguerite and an unnamed boy who lived only two days	6/16/26
Clara and Della	2/26/28
Harriet and Helen	11/28/29
Charlotte	3/12/31
Elizabeth and Harry	4/ 8/32
Benjamin	8/12/33
David and Paul	1/12/35
Franklin and Elinor	6/12/37

has one child The mother has five siblings, only one of which, a brother, has children There are no twins among the children of the siblings of either parent Mrs H F's mother, who claims to know the family history very well states that she has never heard of any twins on her side of the family

This case assumes especial interest when it is considered in the light of some recent studies of human twinning There has long been a widespread belief that twinning tends to run in families, and there are numerous reported instances of family lines in which this tendency is especially clearly manifested Within recent years the existence of such a hereditary predisposition has been confirmed by several investigators in Europe and in this country The reports of Davenport<sup>4</sup>

Curtius,<sup>5</sup> Curtius and von Verschuer,<sup>6</sup> Eckert<sup>7</sup> and Greulich<sup>8</sup> point to the existence of a hereditary tendency to the production of fraternal twins, for the incidence of previous twinning among the siblings and other close relatives of parents of fraternal twins was found by these investigators to be several times greater than that among the population as a whole Strangely enough, this increase in the frequency of twin births proved to be quite as marked on the father's side as on the mother's This surprising observation was made independently by workers both in this country and in Europe, and, since it is based in each instance on a large number of cases and on data which have been subjected to careful statistical analysis, there seems to be no doubt of its validity This is an especially disturbing observation, because it seems to attribute to the male a role in the production of fraternal twins which cannot be reconciled with the accepted theory of their genesis It is interesting to note that in the present case also there is a definite history of previous multiple births on the father's side

It is usually assumed that fraternal twins are always produced by the fertilization of two ova derived from separate follicles either from the same or from different ovaries, that such double ovulations are exceptional and that they result from the aberrant functioning of an ovulatory mechanism the control of which is inherent in the maternal organism and cannot possibly be influenced by the father That double ovulation may be produced by the approximately simultaneous rupture of one follicle in each ovary has been established by Allen, Pratt Newell and Bland,<sup>9</sup> who recovered one ovum



Fig 3—Harriet and Helen

from each uterine tube at laparotomy from a woman in each of whose ovaries a fresh corpus luteum was found The rupture of two follicles in one ovary dur-

<sup>5</sup> Curtius F Ueber erbliche Beziehungen zwischen einigen und zweien Zwillingen und die Zwillingsvererbung im allgemeinen Zt chr f Konstitutionslehre 13 266 317 1927

<sup>6</sup> Curtius F and von Verschuer O Die Anlage zur Entstehung von Zwillingen und ihre Vererbung Arch f Rassen u Gesellschaft Biol 26 361 387 1932

<sup>7</sup> Eckert F Die Zwillings Geburten in Oberamt Tübingen aus den Jahren 1901 1925 Inaugural Dissertation Tübingen 1928

<sup>8</sup> Greulich William Walter Heredity in Human Twinning Am J Phys Anthropol 19 391-431 (Oct Dec.) 1934

<sup>9</sup> Allen Edgar Pratt J P Newell Q U and Bland I J Recovery of Human Ova from Uterine Tubes Time of Ovulation in Menstrual Cycle J A M A 91 1018 1020 (Oct. 6) 1924

<sup>4</sup> Davenport C B Influence of the Male in the Production of Human Twins Am Naturalist 54 122 129 1920

ing a single cycle is also known to occur. In figure 7 is reproduced a photomicrograph of a section of an ovary which was removed at operation from a non-pregnant 21 year old white woman. In it can be seen a portion of two young corpora lutea whose state of development suggests that they were derived from two



Fig 4—Harry and Elizabeth

adjacent follicles which ruptured at about the same time. It appears, however, that the rupture of two follicles is not always necessary for the formation of dichorionic twins.

Greulich<sup>8</sup> (page 425) has described a case of a 19 year old white woman in whose uterus dichorionic twin conceptuses were found at operation. The implantation sites were separated by some distance from each other but yet were sufficiently close so that the two placentas might have fused had both conceptuses continued their development. Despite the indubitable presence of two chorions, an examination of the ovaries disclosed only one corpus luteum. Wieman and Weichert<sup>10</sup> recently described a second case in which dichorionic twinning was associated with a single corpus luteum. In their case the material was obtained at autopsy and both ovaries were sectioned in a vain search for a second corpus luteum. It appears therefore to be definitely established that human dichorionic twins may result from the fertilization of the contents of a single follicle.

Several possible explanations of this conclusion suggest themselves. First, the follicle may have contained two ova. Polyovular follicles have been found in human ovaries by Stoeckel,<sup>11</sup> Rabl,<sup>12</sup> Strassmann,<sup>13</sup> Arnold,<sup>14</sup> Bumm,<sup>15</sup> and others. In his discussion of fraternal twins, the last named author (page 290) commented on the occasional finding of but a single corpus luteum in the ovaries of women who died immediately after the birth of such twins and expressed the opinion that the

origin of twins from polyovular follicles appears to be "a not exceptionally rare occurrence." Hartman,<sup>16</sup> in discussing the subject of polyovular follicles, wrote as follows (page 29): "It seems certain, then, that most polyovular follicles are obliterated, but the possibility must be left open (as Hellin also contends) that occasionally such a follicle may reach maturity, even though the evidence in favor of this is not complete." Through the kindness of Prof. Harold Cummings of Tulane University of Louisiana Medical School I have been able to examine some sections of the ovaries described by Arnold.<sup>14</sup> Practically every follicle in the sections examined contained more than one ovum, and the size and appearance of those polyovular follicles make it seem rather probable that more than one ovum of some of them would have been susceptible of fertilization.

A second possible way in which dichorionic twins could be derived from the contents of a single follicle is that the follicle contained only one ovum but that after fertilization the blastomeres separated at the two cell stage and each subsequently developed into a separate embryo with its own chorion. Such a mechanism would, however, result in the formation of identical twins who, originally at least, were dichorionic. The possibility of identical twins arising by a separation of early blastomeres was favored by Wilder,<sup>17</sup> though according to Newman,<sup>18</sup> he subsequently abandoned the notion. Von Verschuer<sup>19</sup> considered such a mode of origin possible, while Arey<sup>20</sup> denied it, citing the common chorion found in the case of identical twins as conclusive proof that the twinning process occurs subsequent to the differentiation of the ovum into an inner



Fig 5—David and Paul

cell mass and an outer trophoctoderm. It may be pointed out, however, that the fact that a given pair of twins is surrounded by a single chorion at birth does not preclude the possibility of its having been

<sup>10</sup> Wieman H. L. and Weichert C. K. An Unusual Double Human Pregnancy with a Single Corpus Luteum. *Anat. Rec.* 65: 201-211 (May 25) 1936.

<sup>11</sup> Stoeckel W. Ueber Teilungsvorgänge in Primordial-Eiern bei einer Erwachsenen. *Arch. mikr. Anat.* 53: 357-384 1898.

<sup>12</sup> Rabl H. Mehrkernige Eizellen und mehreuge Follikel. *Arch. mikr. Anat.* 54: 421-440 1899.

<sup>13</sup> Strassmann Paul. Die mehrfache Schwangerschaft in von Wincel Franz. *Handbuch der Geburtshilfe* 1904.

<sup>14</sup> Arnold L. Adult Human Ovaries with Follicles Containing Several Oocytes. *Anat. Rec.* 6: 413-422 1912.

<sup>15</sup> Bumm E. Grundriss zum Studium der Geburtshilfe. ed. 9. Wiesbaden J. F. Bergmann 1913.

<sup>16</sup> Hartman Carl G. Polynuclear Ova and Polyovular Follicles in the Opossum and Other Mammals with Special Reference to the Problem of Fecundity. *Am. J. Anat.* 37: 1-51 (March) 1926.

<sup>17</sup> Wilder H. H. Duplicate Twins and Double Monsters. *Am. J. Anat.* 3: 387-472 1904.

<sup>18</sup> Newman H. H. The Biology of Twins. Chicago: University of Chicago Press 1917.

<sup>19</sup> von Verschuer O. Die biologischen Grundlagen der menschlichen Mehrlingsforschung. *Z. chr. f. indukt. Abstammungsl.* 61: 147-205 1932.

<sup>20</sup> Arey L. B. Direct Proof of the Monozygotic Origin of Human Identical Twins. *Anat. Rec.* 23: 245-251 1922.

dichorionic originally and having subsequently become monochorionic because of the fusion and resorption of the chorionic walls in the area of contact. Fernandez<sup>21</sup> has shown that in the case of *Chaetophractus* (*Dasyus*) villosus, an armadillo found in South America, the two young which at birth are enclosed in a common



Fig. 6—Franklin and Elnor (with Mrs. H. F.)

chorion originally occupy separate chorionic vesicles, which fuse during development. An example of a somewhat comparable fusion of two human chorionic vesicles is described and illustrated by A. W. Meyer.<sup>22</sup>

Since Arey held that human fraternal twins may possibly become monochorionic through a similar fusion of chorionic vesicles, the same possibility would have to be granted for dichorionic monozygotic twins, if such exist. Though the evidence obtained from the study of the Texas armadillo (*Dasyus novemcinctus*) by Newman and Patterson<sup>23</sup> and from the experiments of Stockard<sup>24</sup> supports Arey's view as to the point in development at which human identical twins arise, the possible occasional origin of such twins from separate blastomeres cannot be considered as disproved. Although it appears very unlikely, there exists also the possibility that embryos derived from such separate blastomeres may each retain its individual chorion throughout gestation. Since such twins would be identical, this mechanism could not account for the formation of fraternal twins from the contents of a single follicle.

A third possible way in which dichorionic twins could be derived from the contents of a single follicle was

suggested more than twenty years ago by Danforth, and an essentially similar hypothesis has recently been advanced by Curtius. This involves the fertilization each by a separate sperm, of both the definitive ovum and the second polar body or a cell homologous to it. Before it is penetrated by the sperm, the tubal ovum is, strictly speaking, a secondary oocyte which is in the metaphase of a cell division which, when completed, will result in the formation of the definitive egg and a second polar body. The penetration of the tubal ovum by the sperm provides the stimulus for the completion of this cell division. According to this hypothesis, the sperm of some men cause the tubal ovum to form two cells, both of which are susceptible of being fertilized each, of course by a different sperm. Such fertilization would result in the production of twins who had the same heredity from the mother's side but different paternal heredity. Such twins might be of like or unlike sex and would presumably be intermediate between identical and ordinary double-egg twins in the degree of resemblance which they would bear to each other. This hypothetical mechanism seems to be the most reasonable yet advanced to explain how the heredity of the father could be a factor in the production of dichorionic twins.

A careful microscopic examination of the ovaries in other cases in which a dichorionic twin pregnancy is found at operation or at autopsy to be associated with a single corpus luteum would throw further light on the probable twinning mechanism involved in such cases. If the ovaries are found to contain polyovular follicles, the father may fairly be absolved of any special responsibility for the production of the twins. The absence of polyovular follicles would, on the other hand, lend additional credence to the hypothesis that such dichorionic twinning is attributable to some peculiarity of the sperm and would provide a possible explanation of the observed transmission of this twinning tendency through the male.

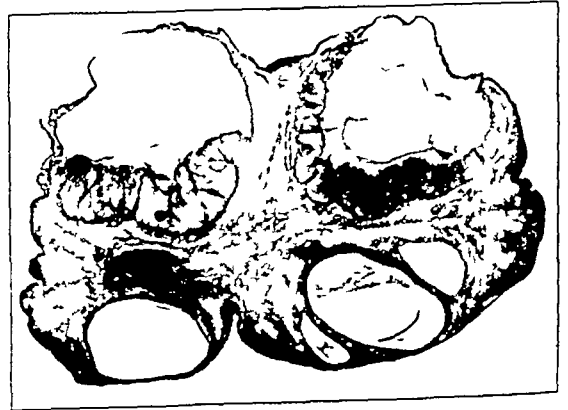


Fig. 7—Section of an ovary removed at operation from a 21 year old white woman showing two corpora lutea of approximately the same age.

A similar examination of the ovaries of women who, like Mrs. H. F., have had repeated dichorionic twin pregnancies, would also be instructive. Here again the presence of polyovular follicles would suggest that the observed twinning is attributable to some ovarian peculiarity and is therefore an exclusive maternal attribute. The presence of two or more corpora lutea of about the same age would have to be similarly inter-

21 Fernandez M. Ueber einige Entwicklungsstadien des Peludo (*Dasyus villosus*) und ihre Beziehung zum Problem der spezifischen Isolembryonie des Genus *Tatusia*. *Anat. Anz.* 48: 303-327, 1915.

22 Meyer A. W. Analysis of Abortuses Classified as Pathologic Contributions to Embryology 12. Publication 56. Washington, D. C. Carnegie Institution of Washington, 1921, plate 4, figures 30 and 31.

23 Newman H. H. and Patterson J. T. Development of the Nine Banded Armadillo from the Primitive Streak Stage to Birth, with Especial Reference to the Question of Specific Isolembryony. *J. Morphol.* 21: 39-444, 1910.

24 Stockard C. K. Developmental Rate and Structural Expression in an Experimental Study of Twin Double Monsters and Single Deformities. *Am. J. Anat.* 28: 11-25, 1921.

25 Danforth C. H. Is Twinning Hereditary. *J. Hered.* 7: 193-20, 1916.

preted, unless one were rash enough to postulate that, as in the case of the cat and the rabbit, some human males are able to induce polyovulation

Further progress in the investigation of this problem is contingent on the continued interest and cooperation of the surgeon and the pathologist, who alone are in a position to make pertinent observations and to obtain the necessary material for study. I bespeak their aid in the solution of this problem, because it is one of considerable theoretical importance

333 Cedar Street

## AN OUTBREAK OF EPIDEMIC DIARRHEA IN THE NEW-BORN

MORRIS GREENBERG M.D.

AND

BENNO M. WRONKER M.D.

NEW YORK

Diarrhea occurs occasionally in new-born infants but it is easily controlled with simple measures. Few occurrences have been recorded in the literature of epidemics of diarrhea in new-born infants. During the last three years, however, more than twenty-five such epidemics have occurred in various hospitals in New York City, a fact which led the department of health early in 1936 to call the attention of physicians and lying-in institutions to the condition, urging that all cases be promptly reported to the department of health for investigation.<sup>1</sup>

A report of the investigations made by the department of health<sup>2</sup> was presented at the annual session of the American Medical Association in Atlantic City in 1937.

We have had the opportunity to follow carefully one of the epidemics that occurred in the nursery for new-born infants of a general hospital in this city and are reporting our results. We shall make no attempt to discuss the literature on the subject as this is adequately covered in the paper mentioned.<sup>2</sup> We wish, however, to call attention to a report<sup>3</sup> of one of the epidemics in this city with which our observations are in general agreement.

The epidemic began about Jan. 25, 1937, and was confined to the nursery housing the new-born infants of the ward and semiprivate services located on the third floor of the hospital building. While the epidemic was in progress babies in the nursery of the private pavilion, located on the sixth floor of the same building, were not affected.

The onset was insidious so that we were uncertain at first whether anything extraordinary was occurring in spite of the fact that we were acquainted with the syndrome. Our service began on the first of February. What struck us at first was that many of the babies in the nursery had an average of five stools a day and that occasionally one or two of these were loose. A second fact that impressed us was that many of the infants did not gain in weight and that a number were

discharged home on the tenth day weighing from one to several ounces less than at birth.

February 11 an infant that had been discharged from the nursery six days before was readmitted to the pediatric wards. It presented a typical picture of gastro-intestinal intoxication and dehydration and had pneumonia and otitis media. It died within twenty-four hours. According to the mother's story the child had no diarrhea at home but seemed ill and did not gain in weight. About the third week in February an infant that had been discharged from the nursery February 14 was readmitted to another hospital with fever and diarrhea. It died of general sepsis, presumably from an umbilical infection. While in our nursery it had had four or five stools a day and weighed 11 ounces (313 Gm.) less on discharge than at birth. About the same time in the nursery an infant with congenital syphilis died at the age of 9 days. This infant had from two to four stools a day, occasionally loose. There were, then, three deaths during the month of February out of a population of fifty-four babies. This was unusual and could not fail to attract our attention and cause us concern. However, the fact that none of the babies had typical diarrhea and that all died with definite pathologic lesions—sepsis in one case, pneumonia in a second and congenital syphilis in the third—made us decide to keep the nursery open but to keep a watchful eye on it. We consulted the epidemiologist of the New York City Health Department and received his permission to proceed as to plan.

As part of our efforts to discover why the infants were not doing well and to clear up the situation we decided on a critical survey of the management of the nursery. We promulgated a number of new regulations and insisted on strict observance of some of the old ones.

1. All formulas had been prepared in the general diet kitchen by specially trained dietitians who sterilized all bottles and accessories before use. The dietitians were properly gowned and gloved during the preparation of the formulas. The formula room, however, was also used in the preparation of diets for adults at such times as it was not needed for the preparation of the infants' food. This was corrected. A newly built room was set aside for the preparation of formulas exclusively. The same rigid asepsis was used as before. Nothing was stored in the room except a stove used for sterilization and the articles used for the infants' diet. No one besides the dietitians was permitted to enter the room. The formulas were made exclusively of evaporated milk 1 part water 3 parts and a preparation of maltose and dextrin 2 tablespoonfuls to 21 ounces of formula. The bottles were properly capped and placed in the refrigerator. As many babies as possible were kept on the breast only. Those who required extra feeding however were given the evaporated milk formula.

2. There were two nurses on duty in the nursery. Previously one of them helped out occasionally with the obstetric patients on Sundays when some of the other nurses were off duty. We made and enforced the rule that no nurse working in the nursery should help out in any other part of the hospital.

3. We enforced the existing rule that only physicians taking care of the new-born infants should be permitted in the nursery and that they must wear a gown with long sleeves and a mask before handling a baby.

From the Department of Pediatrics, Svedham Hospital and the Bureau of Preventable Diseases, Department of Health, City of New York.  
1. Fatal Diarrheal Disease Among New Born Infants Quarterly Bulletin, Department of Health, City of New York, 4, February 1936.

2. Rice, J. L., Best, W. H., Frant, Samuel and Abramson, Harold. Epidemic Diarrhea of the New Born. J. A. M. A. 109: 475 (Aug. 14) 1937.

3. Barenberg, L. H., Levy, Walter and Grand, M. J. H. An Epidemic of Infectious Diarrhea in the New Born. I. A. M. A. 106: 1256 (April 11) 1936.

4 Paper pads had been in use before. These were placed on the examining table and the baby placed on the pad for examination. We thought that this permitted the possible contamination of the table by urine or fecal matter seeping through the pad. We therefore ordered individual quilted pads to be used under the paper ones for each baby.

5 The rule was enforced that nurses scrub before and after handling a baby. All nurses while on duty in the nursery wore gowns and masks.

6 All linen was ordered sterilized in the autoclave.

7 Cathartics were ordered discontinued whenever possible for obstetric patients.

In spite of our vigilance, the situation in the nursery did not improve. Instead there was a perceptible aggravation of symptoms. Stools became more frequent, with many more loose ones, the babies continued to lose weight, and some took their food poorly. We decided, therefore, on more rigid measures.

All babies in the nursery were moved into a large room that had been newly cleaned and washed, and the nursery was then cleaned, scrubbed and washed. Newly washed cribs were installed. A new nurse was put in charge of the cleaned nursery, the former nurses being transferred along with the babies. We now had two nurseries, a clean one and a contaminated one, each with a different personnel and completely separated from each other. We attempted to separate the newly admitted mothers from those already in the wards, but it was not possible to do so as thoroughly as we wished in the short time we had. All newly born babies were admitted to the clean nursery. They were nursed exclusively but received 5 per cent dextrose solution, made up from sterile ampules, by mouth between nursings. Altogether eight babies were admitted to the clean nursery in a week's time. Despite our care and precautions most of them developed frequent and occasionally loose stools and lost weight. Acute intestinal intoxication developed in three after they were discharged home and they were readmitted to the pediatric wards, and two died. We decided that it was useless to temporize further. The attending obstetrician agreed with us and stopped all admissions to the obstetric service. The entire third floor was closed March 18 and all the rooms and halls were cleaned and painted. The floor was reopened a week later. No other case of diarrhea occurred in the nursery from then until we went off service two and a half months later and the infants behaved normally in every way. This was so in spite of the fact that the same nurses were in charge of the nursery and the same physicians and nurses on the obstetric and pediatric services and the same formula was used for supplementary feeding prepared by the same dietitians.

#### SYMPTOMS

*Diarrhea*—This was the first symptom that the infants presented. At the beginning the stools were increased in frequency to four or five instead of the usual two or three a day. The consistency was good except that now and then a loose stool was passed. The frequency and number soon increased and the consistency changed so that many more loose stools were passed. Finally, in the babies in whom toxicosis developed none but loose and watery stools were seen. The stools were generally yellow, but some were greenish. They contained no curds or only occasional ones. Mucus was not common, although it was seen now and then. Blood was never observed.

*Loss of Weight*—The next most common symptom was loss of weight. Even those babies who kept well after leaving the nursery, but who had four or five stools a day while in the hospital, left weighing less than at birth. The loss of weight at the end of ten days, when the babies are usually discharged, varied between 2 and 12 ounces (57 and 340 Gm.).

*Refusal of Food*—This was not an outstanding feature in our babies. Some took their food well throughout their illness, while some left part of their formulas. There was no absolute refusal to take food.

*Vomiting*—This was not a marked feature early in the disease. Some spitting up occurred, but not much more than in a group of normal new-born infants. Vomiting became a marked feature in some of the babies late in the disease.

*Fever*—Most of the babies had no fever. Some had slight fever, from 99 to 100 F. A few, with complications, had high fever, 103 or 104 F.

*Restlessness, Irritability*—These were not early symptoms. Many of the babies were never restless or irritable and cried little. The very sick ones, and especially those in whom complications developed, became very irritable and restless and cried a great deal.

*Dehydration*—This was a prominent feature in the very sick babies, particularly in those who died. The picture was typically that of gastro-intestinal intoxication. All the elements were present: dehydration, loss of skin turgor, sunken eyes, depressed fontanel, dusky pallor, restlessness and feeble cry. Our experience in this respect is different from that of Barenberg and his associates. They had few cases of intoxication.

*Day of Onset*—The age of onset varied from the first to the seventeenth day of life. However, only one baby took sick on the first day, and only one each on the ninth, tenth, twelfth and seventeenth days. Most of the infants took sick on the second, third and fourth days of life (thirteen, seventeen and eight cases respectively) and there were six cases each on the fifth and sixth days of life.

*Sex*—No difference in sex incidence was noted. About as many male as female children took ill.

#### TREATMENT

In the beginning of the epidemic we attempted to check the diarrhea, first by omitting all sugar from the formula used as a complementary feeding, secondly, by substituting boiled milk and water for the evaporated milk, and, thirdly, by using protein milk as a complementary food. Finally we used only breast nursings, omitted all complementary feeding and gave the infants 5 per cent dextrose solution between nursings. This was made up from sterile ampules. As already stated none of these measures had any effect. When symptoms of toxicosis developed the infants were treated by a preliminary starvation of twenty-four hours, then the gradual introduction of protein milk or breast milk in small quantities. Parenteral fluid was administered several times a day in the form of dextrose solution intravenously and subcutaneously. We used no drugs.

#### PATHOLOGY

The bacteriologic procedures that were carried out in an attempt to find a cause for the infection yielded negative results. Cultures were made of the stools of the infants and were examined for the typhoid and

dysentery group of organisms. Similar cultures were made of the stools of the mothers of the babies, of the nurses, attendants in the nursery, dietitians and physicians. All were negative. Throat cultures were also made of the physicians. No positive results were obtained.

Autopsies were performed on several of the babies that died in our hospital. The pathologic appearance was similar to that of other cases of gastro-intestinal intoxication. No specific pathologic lesions were noted. The jejunum and ileum were injected and contracted, the colon was distended. There was cloudy swelling of the liver, spleen and kidneys. The mesenteric glands were enlarged. Complicating conditions were found in a few bronchopneumonia in two, mastoiditis and meningitis (from which the pneumococcus was recovered) in one, aspirated milk in the trachea and bronchi in a baby that died suddenly, and peritonitis and pericarditis in an infant that died in another hospital with a clinical diagnosis of sepsis.

#### EPIDEMIOLOGY

The epidemic started January 26 and lasted until March 25, when the last case occurred. During this period a total of 129 live babies were born. Of these, fifty-two had epidemic diarrhea, a morbidity rate of

#### *Summary of Epidemic*

Total number of new born infants	129
Total number of sick babies	52
Deaths	15
Morbidity	40%
Mortality	12%
Case fatality	29%

40 per cent. Fifteen babies died, giving a mortality rate of 12 per cent and a case fatality rate of 29 per cent. We believe that the reason why our mortality rate was lower than in other institutions was that we profited from the experience of others and were thus able to recognize the syndrome early. Also, we closed the obstetric service as soon as we saw that we could not control the epidemic.

Attempts to trace the epidemic to an original source were unavailing. We were able to exclude the formula room and its attendants as a source because all complementary feedings for the private nursery on the sixth floor were prepared with the same ingredients at the same time and by the same personnel as for the ward babies, yet no new-born infant in the private nursery took sick. The attending obstetricians delivered private patients as well as ward patients, if they were the carriers they should have given the disease to the infants in the private pavilion. The attending pediatricians, too, took care of new-born babies in the private pavilion. Yet, as already stated, all new-born infants in the private pavilion remained well.

There is another reason why we feel that we can rule out the diet kitchen as well as the attending obstetricians and pediatricians, and even the nurses and attendants in the nursery as original sources of the contagion or as probable carriers. When the wards and nursery were reopened in the beginning of April, the same personnel remained in attendance, yet no case broke out during the rest of our service, a period of about two months. Of course we have not excluded the mechanical spread of the epidemic from contaminated to noncontaminated object by nurses, phy-

sicians or attendants. It is conceivable, for instance, that fingers soiled by a contaminated diaper might have touched the nipple of a bottle which was later offered to a healthy infant. This, or some similar break in technic, might have happened in spite of our precautions.

The possibility has been suggested that the infection is air borne and that it is caused by a virus and attacks the respiratory tract primarily. We have no evidence to offer for or against the idea. Most of our sick babies had no signs of infection of the upper respiratory tract.

#### COMMENT

Our experience, reinforced by the experience of the health department in other institutions, convinces us that epidemic diarrhea of the new-born, though probably not a new disease, is a definite syndrome and one that merits the attention of obstetricians, pediatricians and public health officers. Once an epidemic has broken out in an institution it is folly to temporize. The morbidity and death rate will only be increased if half-way measures are adopted. Admissions to the obstetric service must be stopped immediately, and as soon as all the new-born infants are evacuated the obstetric wards and the nursery should be carefully scrubbed, and perhaps painted, before new admissions are made. Only in this way can the epidemic be checked early. Furthermore, it is important to detect an epidemic early in its course. This can be done if the staff attending a nursery for the new-born will consider every case of diarrhea in a new-born infant as suspect and will consider as an epidemic the occurrence of diarrhea lasting more than twenty-four hours simultaneously in several babies. The health department of New York City has made diarrhea in the new-born a reportable disease. Such action should help to control epidemics and ought to be adopted by health officers generally.

The prevention of epidemics is more important than their detection. Unfortunately it is not always as easy. We are convinced that it could be achieved or closely approached in the case of epidemic diarrhea of the new-born if nurseries for new-born infants adopted an aseptic technic similar to that in use in an operating room. The expense involved, however, makes it prohibitive for most hospitals. The next best thing is for each hospital to adopt as rigid a technic as possible. Surely it should be possible to insist that nurses scrub between the handling of babies or that physicians wear gowns and masks and scrub before examining an infant.

A matter of great importance that has received practically no attention whatever is the crowding of nurseries. Most nurseries for new-born infants are altogether too small for the number of babies in them. Hospital authorities pay a great deal of attention to the rooms that the mothers occupy and decorate them in the latest colors and style, and with all the new gewgaws. But the babies are still housed in the same rooms with no thought or attention to light, air or crowding. No standards have been established for nurseries, and there are no established requirements, legally enforceable, for the lighting, ventilation, humidity, heat or cubic air space per crib in a hospital nursery. Until such standards are established and enforced, nurseries will remain hazards, greater or less, depending on the consciences and intelligence of the authorities in the different hospitals.

## CONCLUSIONS

1 An epidemic of diarrhea in the new-born in a New York hospital lasted about two months. Fifty-two babies took sick out of a total population of 129 babies and fifteen died.

2 The commonest cause of death was alimentary toxicosis. Otitis media and pneumonia were the commonest complications.

3 Attempts to limit the epidemic were unavailing until all obstetric admissions were stopped.

4 Search for a specific cause of the epidemic yielded negative results.

143 West 87th Street—150 West 87th Street

## JAUNDICE CAUSED BY FUNCTIONAL OBSTRUCTION

REFLEX SPASM OF THE SPHINCTER OF ODDI

ION PAVEL, M.D.

BUCHAREST, RUMANIA

On closer study of the various types of jaundice, it is readily realized that, except for jaundice due to mechanical obstruction and for hemolytic jaundice, both of which are well defined by their clinical and anatomic features, there is great uncertainty regarding the pathogenesis of the other types of jaundice.

This last type of jaundice is supposed to be due to hepatitis, according to Fiessinger's and Eppinger's investigations. No decisive proof has been produced so far to support such a view. It may be objected that the anatomic evidence, in particular, is not conclusive. Eppinger himself gave a reserved opinion regarding the significance of hepatic lesions in relation to jaundice. More recently several authors insisted on the importance of functional tests. If jaundice is due to hepatitis, on functional investigation the liver must show variations as compared with the normal liver. Later the functional examination of the liver was adopted to justify the hepatic origin of this type of jaundice. The carbohydrate test, for instance, and particularly the presence of galactosuria, was then considered as the best argument offered in support of this pathogenesis. A number of papers marked the same evolution and it is significant, for instance, to see Eppinger's readiness to abandon the anatomic criterion in favor of the functional test. Yet it was the anatomic study of the jaundiced liver which had induced him to sponsor the pathogenic role of the hepatitis. One is therefore compelled to conclude that the anatomic argument had a rather questionable value as, in fact, contemporary studies have proved.

Nevertheless, recent investigations have shown that interpretation of the galactosuria test is rather difficult.

In a recent paper based on clinical observations, statistics, experiments and evolution my co-workers and I<sup>1</sup> proved, we believe, that this test cannot be taken into account in the pathogenic study of jaundice unless with considerable reservation. The positivity of the test appears to be dependent at least in great part, on a simultaneous pathologic change in the pancreas. Other arguments should therefore be found to support the theory of pathogenesis by hepatitis which, however, we believe to be true in a certain number of instances.

Apart from the reservation regarding the interpretation of the carbohydrate test I wish to emphasize the fact that current exploration of the secretion and excretion of bile by means of the Einhorn tube has provided me with an excellent means of hepatic exploration. It is surprising that authors who accept the specificity of the hepatic functions have endeavored to determine the hepatic origin of jaundice by examining the other functions of the liver and have neglected to investigate the biliary secretion. It was by the observation of the flow of the bile into the duodenum in certain cases of long standing jaundice that seven years ago we came to the conclusion that, in a certain number of cases, jaundice is caused by a reflex spasm of the sphincter of Oddi, a functional obstacle.

Our observations have been confirmed and our interpretation accepted by a number of authors.<sup>2</sup> The clinical features of this type of jaundice may be briefly recalled here.

1 From a clinical standpoint jaundice may be ascribed to a spasm of the sphincter of the common duct when, in a case of persisting icterus, the general state of health has not yet been impaired and when the jaundice presents variations in intensity. In such cases, jaundice as determined by bilirubinometry is not usually intense. The discoloration of the feces, although marked, is never complete and it never takes the appearance of mastic.

2 The positive diagnosis of jaundice due to spasm of the sphincter of the common duct is based particularly on examination of the biliary excretion by means of the Meltzer-Lyon test. This examination reveals the following objective symptoms:

(a) Resumption of the normal flow of bile and of normally colored stools following medical drainage. After a certain number of daily repetitions, drainage must induce the disappearance of cutaneous icterus.

(b) Complete reduction of the symptom of jaundice by medical drainage in the course of a morbid complex. Thus in two of the patients under observation who had jaundice and fever, the former disappeared while the fever suggestive of an infection causing the spasm remained unaffected. Recurrence of the jaundice after suppression of the duodenal tube is possible.

(c) Possible cessation of the biliary flow and recoloration of the patient on a purely emotive basis, such as a fright despite continued drainage.

3 Other less important and less specific symptoms can be helpful in the diagnosis.

(a) The varying success of duodenal drainage. The catheter may easily reach the second portion of the duodenum in a first session of drainage but may not pass in the course of a subsequent session. The patient may at the least incident, reject the tube into the stomach, and this may occur several times in the course of the same session of tubing.

(b) The particularly intense spastic condition of the duodenum, as shown by X-ray examination.

These two signs, which suggest local irritability and a tendency to spasm in the ampullary region, have the advantage of not requiring too long an investigation. Nevertheless, they require subsequent verification.

2 (a) Nann Muscel I and Pavel Ion. *Presse med.* 38, 1260 (Sept. 17), 1930. (b) Pavel Ion. *ibid.* 40, 1948 (Dec. 24), 1932. (c) *Wien klin. Wchnschr.* 47, 1485 (Dec. 7), 1934. (d) *Bruxelles med.* 10, 1, 81 (Oct. 11), 1936.  
3 Von Hahnerer Hans. *Med. Klin.* 28, 423 (March 24), 1933.  
Chabrol F., Brocq P. and Porin J. *Presse med.* 10, 1053 (July 6), 1932.  
Weill O. *Bruxelles med.* 14, 274 (Dec. 24), 1933.  
Desmarest. *Semaine d'hop. de Paris* 12, 191 (April 1), 1935.  
Picot. *Mem. Acad. de chir.* 61, 1322 (Dec. 14), 1935.  
Angelescu C. *Topovici A. anal. (impeteanu) Rev. de chir. Bucuresti* 30, 9 (Jan. April), 1936.  
Kirschner Martin. *Med. Klin.* 20, 1705 (Dec. 15), 1933.

1 Pavel I., Florin I. and Radvan I. *Ann. de med.* 75, 389 (Mar.) 1934.



4 There is a negative symptom which consists of discarding as far as possible the diagnosis of hemolytic jaundice caused by mechanical obstruction and by hepatitis

#### NATURE OF LESIONS PRODUCING A REFLEX SPASM OF THE SPHINCTER

It is generally difficult to recognize the precise nature and location of the lesions, whether inflammatory or not, which may cause, by reflex action, spasm of the sphincter of the common duct

At the time of our earliest observations, as pointed out in our first paper,<sup>2a</sup> we listed the choledochus, the duodenum and the head of the pancreas as the regions in which inflammation might give rise to spasm of the sphincter of the common duct. We have since added more distant organs, such as the gallbladder, in which inflammation might induce lymphangitis

As to the duodenum, we believe that the influence exerted by the reflex irritation starting from this organ has already been demonstrated. We have indeed a confirmation of this hypothesis in a clinical observation<sup>b</sup> followed by anatomic examination. The duodenum was the seat of mild adenomatosis, with subchronic duodenitis. Cytologic examination of bile (A) in certain cases of jaundice substantiates the same theory. One may find groups of cylindric cells not bile stained, as well as leukocytes, mucus and microbe masses which are highly suggestive. Similarly, a ray examination in another instance may demonstrate irritability followed by marked spasm of the duodenum. The difficulties attending duodenal tubage, previously mentioned, also support this view

As to the choledochus, its inflammation, particularly that of the ampulla of Vater, is liable to initiate the spastic condition of the sphincter. We<sup>4</sup> found evidence in support of its influence in a case in which the surgeon was under the impression that the wall of the choledochus had thickened. Examination of the fluids obtained by duodenal tubage pointed to the same conclusion and induced us to suspect the presence of choledochitis even before the patient was operated on.

As to pancreatitis, its possible influence appears to be rather difficult to establish. We have admitted it as the origin of the spasm rather by exclusion of all other irritative causes. However, there is strong evidence of pathologic changes in the region of the head of the pancreas

At the postmortem examination of a woman who had suffered from retentive jaundice and who died after operation, we observed that the choledochus and the ampulla of Vater were patent. We also saw pronounced chronic pancreatitis and a small cancerous nodule located in the vicinity of the ampulla of Vater. No doubt retentive jaundice was due in this instance less to mechanical obstruction than to spasm of the sphincter of Oddi, initiated by the reflex irritation induced by the cancerous nodule in the head of the pancreas

Thus, at the present stage of my investigations, I may assume that the spasm of the sphincter of the common duct may be produced by pathologic changes situated in a region comprising the duodenum, the choledochus and the head of the pancreas, as well as by changes in the pericholedochal lymphatics caused by regional inflammation, including inflammation of the gallbladder

#### SURGICAL DIAGNOSIS OF A SPASTIC SPHINCTER

Needless to say, the surgeon may establish better than any one else spasmodic jaundice, i.e., obstructive jaundice of the type described in this paper. The previously mentioned symptoms are obviously unnecessary for a right diagnosis if the operation shows no stones in the gallbladder in patients supposed to have them

Such was the case with a patient who had recurrent painful attacks of jaundice and fever. A first operation was performed in order to extirpate the gallbladder (stoneless gallbladder). The patient felt better, then discoloration of the feces set in, and a fistula opened in the wall, through which bile escaped. A second operation disclosed that the ducts were patent. A fistula was made, which remained open for a month, during which time the feces showed normal color. The color remained normal for two months after closure of the fistula. Thereupon frequent painful attacks reappeared, with fever, jaundice and discoloration of the feces. After three months' stay in a clinic the patient was advised to choose between methodical, repeated medical drainage and a third operation. The latter was chosen. Despite the fact that the ampulla of Vater was permeable, we advised the surgeon to perform dilation of the sphincter and place a rubber tube in the choledochus, leaving the other end in the duodenum (procedure of Duval). The jaundice disappeared promptly, and during the three years we had news from the patient there was no recurrence

Von Haberer<sup>3</sup> reported an observation which has all the appearance of a check-up by experimental medicine in favor of the influence exerted by the spasm of the sphincter of the common duct on the appearance of icterus. In his case, although the ampulla of Vater, twice inspected operatively, was found permeable to the catheter, the bile which was flowing out freely through the operative drain did not pass into the duodenum, and the feces were discolored. If, in order to force the bile through the ampulla of Vater, the draining tube was clamped, the feces did not change color again but the superior abdominal region became painful, and, if the closure lasted several days, jaundice recurred. The patient recovered promptly and completely after a choledochoduodenostomy which excluded the ampulla of Vater from the path of the bile

#### RELATIONSHIP OF FUNCTIONAL JAUNDICE AND THAT DUE TO HEPATITIS

It is of interest to discuss the relationship between jaundice due to functional obstruction and jaundice supposed to be caused by hepatitis, jaundice induced by mechanical obstruction

The description of jaundice caused by functional obstruction is no doubt an encroachment on the field classically reserved for jaundice induced by hepatitis. As the former gave no evidence of permanent obstruction and was not hemolytic, it was naturally considered as due to hepatitis. It is interesting to note that there is in fact evidence of hepatitis in some of the cases under our observation, we are therefore compelled to discuss the relationship of hepatitis to jaundice caused by functional obstruction

We have not attempted to ascertain systematically the presence of hepatitis in our patients by the test classically employed to this end, and we have stated the cause of our reluctance to do so at the beginning of this paper. Only once did we make use of the galactose test, and the result was negative. On the

<sup>4</sup> Pavel, Ion, Claudian and Ghitesco. Bull. et mem. Soc. nat. de chir. 61: 210 (Feb. 16) 1935



contrary exploration of the biliary secretion was necessary and was sufficient to elucidate the condition of the biliary secretion and excretion, the only interesting observation from the point of view of our study. Hepatitis was, however, conspicuous in some of our cases and demonstrated by anatomic and histologic examination. This is to say that in our investigations we renounced the following two prejudices: first, that a test of hepatic insufficiency which leaves out of consideration the biliary secretion can reveal the nature of jaundice, and, second, that the anatomic existence of lesions in the region of the liver determines the pathogenic development of concomitant jaundice.

Two observations disclose the inconspicuous if not nonexistent influence exerted by hepatitis in the pathogenesis of spasmodic icterus.

In a previous paper published by Claudian, Ghitesco and me<sup>4</sup> we were dealing with a patient suffering from jaundice which we ascribed to the reflex spasm of the sphincter of Oddi. The medical and surgical treatment inspired by this pathogenesis resulted in the cure of the jaundice. Nevertheless hepatitis, of which we suspected the presence on evidence of hypertrophy of the liver, continued to progress until, a year and a half later, we were able to ascertain the presence of hypertrophic cirrhosis with ascites. Yet, despite the progress of the supposed hepatitis, the jaundice, which disappeared as a result of our treatment, never recurred.

I may recall here of what little consequence are anesthesia, even general, and operative shock in like cases. It is surprising to see, on the one hand, how rapidly jaundice of this type clears as soon as deviation of the flow of bile is obtained and, on the other hand, how insignificant is the repercussion which is anatomically undemable.

An observation reported by Chabrol, Brocq and Porin<sup>5</sup> is just as conclusive. On the fiftieth day of a case of intense jaundice with discoloration of the feces, fever and marked hypertrophy of the liver, after having found the duct sound, these authors performed a cholecystostomy. The anesthetic used was ether. During the hour following operation they were pleasantly surprised to see very dark bile escaping through the fistula. Within twenty-four hours 150 cc had escaped.

A biopsy of the liver disclosed pronounced hepatitis. It may be understood that, after evidence of the prompt secretion of dark bile, the observers should not have hesitated to discard the pathogenesis of hepatitis and to look lower down for the cause of the jaundice. Had they done so they would certainly have found the real cause, i e., the spasm of the sphincter of the common duct.

We believe that hereafter, in determining the pathogenesis of jaundice, the problem will no longer be to ascertain the presence or absence of hepatitis in the patient under examination but to discover whether hepatitis has or has not a part in the appearance of concomitant jaundice.

#### RELATIONSHIP OF FUNCTIONAL OBSTRUCTION AND THAT DUE TO MECHANICAL OBSTRUCTION

As to the relationship of jaundice caused by functional obstruction to jaundice due to mechanical obstruction confusion may arise whenever an element is present whose action of mechanical pressure could be taken into account. Confusion occurs particularly when the condition of the biliary discharge has not been observed by means of the Einhorn tube to ascertain

whether the pressure supposed to exist is valid or not. It may arise in cases of calculus of the cystic duct, adherence or enlargement of the periportal lymph nodes. An error can easily be avoided, however, by functional examination of the bile ducts by the Meltzer-Lyon test, i e., by obtaining bile A, B and C through the duodenal tube. Still more convincing is suppression of the jaundice through repeated drainage. Examination of the biliary excretion, that is, the Meltzer-Lyon test, is a functional test of the liver of unquestionable value.

#### RECURRENCE OF SYMPTOMS AFTER CHOLECYSTECTOMY

There are other clinical types besides long standing jaundice. One of them is particularly interesting because the pathogenesis and the pathogenic treatment proposed are easily verified. I refer to certain cases following cholecystectomy. After this operation, performed when the disease is at an advanced stage and angiocholitis has developed, the previous symptoms frequently return at the moment the fistula closes, particularly when it closes prematurely. Pains, fever and even jaundice with discoloration of the feces appear just as they were before the operation. This recurrence of the symptoms was formerly ascribed (and some times quite rightly, too) to a calculus forgotten in the common bile duct, to an adherence, to obstructive cholelithiasis or to a mucous plug. The symptoms often rendered another operation necessary. Spasm of the sphincter of the common duct can explain all these phenomena. Since examination by means of iodized poppy-seed oil injected through the fistula was introduced, radiographic confirmation has also been obtained. Pribram<sup>6</sup> in particular, and more recently McGowan, Butsch and Walters<sup>7</sup> and Best and Hicken<sup>8</sup> clearly recognized in such cases the spasm of the papilla in the ioentgenogram.

I should like to emphasize again the useful consequences of the pathogenesis proposed, viewed from its practical side. Duodenal tubage, without further operation, can prevent the return of painful attacks of fever and jaundice. Observations have been made which wholly justify this pathogenesis and this treatment.<sup>9</sup>

#### IDIOPATHIC CYST OF COMMON BILE DUCT

Certain types of fugitive jaundice, such as emotive icterus, have been ascribed to the spasm of the sphincter of Oddi. Eppinger and Waltzel have sponsored such a pathogenesis for jaundice related to hepatic colic. I partly believe in this type of jaundice. However, I have found it extremely difficult to confirm the hypothesis by the more or less direct objective signs proposed in this paper.

There is, however, another clinical type, which, although exceptional, is nevertheless of great interest for the theory. I refer to that curious disease termed idiopathic cyst of the common bile duct. Among the explanations of its appearance is this very spasm or hypertonia, of the sphincter of Oddi, and I feel inclined to believe in its reality. Only an intermittent spasm can explain the variations occurring not only in the

<sup>5</sup> Pribram B O. Deutsche med Wchnschr 78 1167 (July 22) 1932

<sup>6</sup> McGowan John M Butsch W L and Walters Waltman Pres sure in the Common Bile Duct of Man J A M A 106 227 (June 27) 1936

<sup>7</sup> Best R R and Hicken N F Cholangiographic Demonstration of Biliary Dysynnergia J A M A 107 1615 (Nov 14) 1936

<sup>8</sup> Jacobovici I and Pavel Ion Arch d mal de l'app d'estif 27 712 1937

dimensions of the cystic distention but also in the intensity of the jaundice. The patient who was the object of our first publication presented a history of operation for idiopathic cyst. The succession in the same patient of idiopathic cyst and later of jaundice due to functional obstruction gives great weight to our theory.

#### TREATMENT

The treatment of jaundice caused by spasm of the sphincter of the common duct varies according to each case. Medical drainage by means of the Einhorn tube suppresses the jaundice but in most cases does not suppress the disease which, in long standing jaundice, occasions the spastic condition of the sphincter of the common duct. The icterus returns as soon as drainage is discontinued. In cases in which treatment of the cause was not successful, intermittent drainage repeated for a long time at variable intervals proved to be an effective treatment. On the contrary, medical drainage is sufficient in cases of jaundice following cholecystectomy when the attacks are caused by hypertonia of the sphincter.

The medical treatment of the infection has marked successes on record. In our first reported case it cured in about ten days the fever significant of infection, which had lasted for a year, and the jaundice disappeared immediately.

Surgical treatment, with temporary or definitive deviation of the flow of bile, plays an important part. I must, however, emphasize the fact that temporary deviation has to be extended over a long period. One month seems to be insufficient. If this precaution is not taken, the results obtained by cholecystostomy are unsatisfactory. In Chabrol, Brocq and Porin's case the operation was followed by recovery, but in our first case cholecystostomy brought improvement only as long as the fistula remained open. The same development occurred in another case. In the latter, the patient recovered only after the introduction, during operation, of a rubber tube through the ampulla of Vater. The tube was left there, according to Duval's procedure. This is the reason why we tried to apply internal lasting drainage with choledochoduodenostomy. In the case reported by Hortolomei and myself<sup>9</sup> the results obtained were satisfactory and permanent. Von Haberer was satisfied with choledochoduodenostomy.

Generally speaking, if one is not successful in suppressing the spasm of the sphincter of Oddi one has to choose the operative method, which ensures more effectively the deviation of the flow of bile elsewhere than through the ampulla of Vater. One should remember that there is no danger in operating in such cases even if the jaundice is of long standing. This is hardly a classic notion, and it still alarms the surgeon and the medical men who are a little too much in fear of hepatitis.

18 Vasile Lascar

<sup>9</sup> Hortolomei Nicolae and Pavel Ion. *Presse med.* 41: 421 (March 15) 1933.

**Face to Face with Clinical Problems**—In our pursuit of the medical sciences we have lost touch with the art of medical practice, and all the anatomy and physiology and pharmacology in the world is not going to guard a young doctor against making an unnecessary number of diagnostic mistakes and consequent errors of treatment, unless he has been brought face to face with clinical problems and learned sound methods of treatment for an ample time—Cushing, Harvey. *Consecration: Medical and Other Papers*. Boston, Little, Brown & Co. 1928.

## DOES AN ATTACK OF ACUTE ANTERIOR POLIOMYELITIS CONFER ADEQUATE IMMUNITY?

REPORT OF FOUR SECOND ATTACKS IN NEW YORK CITY IN 1935

ALFRED E. FISCHER, M.D.

NEW YORK

AND

MAXWELL STILLERMAN, M.D.

GREAT NECK, LONG ISLAND, N. Y.

The common communicable diseases usually are followed by permanent immunity. However, second attacks occasionally occur. They are most frequent in scarlet fever and diphtheria, less common in mumps and, after an interval of years, in whooping cough. In measles, smallpox and chickenpox they are rare.

Second attacks of poliomyelitis have been recorded infrequently in the literature.<sup>1</sup> We have been able to collect thirteen instances which we considered authentic (table 1, cases 1 to 13). In all these, both attacks were of the paralytic type. Because of insufficient or unobtainable data, we classified as doubtful five cases of poliomyelitis (table 1, cases 21 to 25) which had been previously reported as second attacks. The details of cases 14 and 15 were supplied by du Busc and Harmon. The report of case 16 had never been published by Neal.

In 1935 four second attacks of poliomyelitis were seen in New York City, three (cases 17, 18 and 19) by members of the Meningitis Division of the Laboratories of the New York City Department of Health,<sup>2</sup> and one (case 20) by us. These four are being reported in detail. We studied the neutralizing (protecting) properties of the serum from our patient at intervals during and after the second attack. No previous report has appeared in the literature on neutralization (protection) tests made after a second attack of poliomyelitis.

#### HISTORIES OF CASES

**CASE 1<sup>2a</sup>—First Attack**—H. H., a boy, aged 4½ years, became ill Aug. 12, 1933, with a headache and slight sore throat. August 14, some pain and stiffness of the neck developed and he was unable to walk properly. When seen August 16 he was afebrile and somewhat stuporous and irritable. There was a slight inflammation of the throat and slight cervical adenopathy. The neck was moderately stiff and a bilateral Kernig sign was present. Weakness of the right foot was noted. A lumbar puncture August 16 revealed clear fluid with 125 cells per cubic millimeter, which were chiefly mononuclear. The albumin and globulin were slightly increased and the sugar was normal. On August 18 there were 29 cells per cubic millimeter in the spinal fluid. For several months thereafter he received orthopedic treatment. The weakened leg muscles gradually improved.

**Second Attack**—July 19, 1935, he complained of pain in the abdomen, back and right leg. The following day weakness developed in the right leg and on July 21 he was unable to walk. When he was admitted to the hospital on that date he was acutely ill. The temperature was 101.8 F., the pulse 126. The neck and back were held stiffly and he sat up with difficulty. The throat was moderately injected. The cervical

From the Willard Parker Hospital, Department of Hospitals.

<sup>1</sup> Still G. F. Second Attacks of Acute Poliomyelitis and the Minimal Duration of Immunity. *Arch. Dis. Childhood* 5: 295 (Oct.) 1930. Quigley T. B. Second Attacks of Poliomyelitis. Review of the Literature and Report of a Case. *J. A. M. A.* 102: 752 (March 10) 1934.

<sup>2</sup> Dr. Josephine B. Neal gave the authors permission to report the cases.

<sup>2a</sup> Presented at New York Academy of Medicine, Section of Pediatrics, May 13, 1937.

lymph nodes were somewhat enlarged but not tender. There was marked hyperesthesia of the right lower extremity. A pes cavus deformity on the right side was present, with stretching of the extensor tendons, evidently the result of the first attack of poliomyelitis two years previously. He was unable to move the right lower extremity except for extension of the foot. There was also some weakness of the left thigh.

When he was discharged, August 18, his back was still stiff and he was unable to sit up. Weakness in the upper abdominal muscles and the posterior spinal group gradually became evident. He was in bed at home for months.

In July 1936 he had measles and was again admitted to the Willard Parker Hospital. At that time he was able to sit up only with difficulty. He wore a brace on the right leg and

TABLE 1—Cases with Two Attacks of Acute Poliomyelitis

Case Number	Author	Dates of Attacks	Interval Between Attacks	Parts Affected
<i>Positive Cases</i>				
1	Sheppard J A E Mass State Board of Health 1910 p 134	1894 1910	16 years	1 Lower extremities 2 Hands abdomen lower extremities (Landry's paralysis)
2	Quigley T B J A M A 102 702 (March 10) 1934	1931 1933	2 years	1 Left shoulder 2 Bulbo-spinal
3	Still <sup>1</sup>	1924 1929	5 years	1 Left leg 2 Right shoulder
4	Eckert Deutsche med Wchnschr 37 113 (Jan 19) 1911	1903 1909	6 years	1 Left leg 2 Right leg
5	Lucas W P and Osgood R R J A M A 60 1611 (May 24) 1913	1910 1912	2 years	1 Both feet and right leg 2 Right arm and both legs
6	Sanz F Siglo med 62 330 1915	Not stated	14 years	1 Left leg 2 Right leg
7	Taylor E W J Nerv & Ment Dis 44 207 (Sept) 1916	1911 1914	3 years	1 Right leg and left arm 2 Left leg
8	Francis F D and Moncreiff W F J Nerv & Ment Dis 49 273 (April) 1919	1903 1918	15 years	1 Upper extremities 2 Lower extremities
9	Cohen <sup>2a</sup>	1908 1933	25 years	1 Right arm and right leg 2 Left arm and right leg
10		1916 1934	18 years	1 Right arm lower extremities 2 Arms legs trunk
11	Tesdal <sup>2a</sup>	1905 1929	24 years	1 Both legs 2 Both arms
12	Neal Josephine B Poliomyelitis (Survey of International Committee)	1903 1923	20 years	1 Both legs 2 Left thigh
13		1916 1922	6 years	1 Right leg 2 Left leg
14	du Buse L C V Personal communication to authors	1923 1931	8 years	1 Both legs 2 Bulbar
15	Harmon P H Personal communication to authors	Details not available	17 years	1 One leg 2 One arm both legs
16	Neal Josephine B Jackson H W and Appelbaum E Unpublished personal communication to authors	1907 1916	9 years	1 Left arm 2 Nonparalytic
17		1930 1935	5 years	1 Right shoulder and right leg 2 Left external rectus right thigh (patient 3)
18		1931 1935	4 years	1 Right lower extremity 2 Nonparalytic (patient 2)
19		1931 1935	4 years	1 Nonparalytic 2 Bulbar right upper extremity died (patient 4)
20	Fischer A E and Stillerman M	1933 1935	2 years	1 Right leg 2 Right leg and thigh left thigh upper abdominal (patient 1)
<i>Doubtful Cases</i>				
21	Caudoin Paris thesis 1879	Not available	14 years	1 Left Leg 2 Right leg
22	Ballet G and Dutil A Rev med 4 18 1884	Not available	9 years 2 years	1 Left leg 2 Upper extremities 3 Lower extremities
23	Eshner A A M Rec 78 226 1910	1891 1903	12 years	1 Right lower extremity 2 Weakness both hands (followed injury)
24	Peremans G Scalpel 76 1319 1923	Not available	2 years	1 Left leg 2 Left arm
25	Moore T Brit M J 2 166 (July 25) 1904	1927 1933	6 years	1 Lower extremities 2 Hands abdomen lower extremities (followed measles)
26	Harmon P H Personal communication to authors	Details not available	8 years	1 Both legs 2 Both legs

The right knee jerk was absent. A bilateral Kernig sign was present. Lumbar puncture July 21 revealed slightly ground glass fluid containing 585 cells per cubic millimeter, mostly mononuclears. Smear and culture were negative. The albumin and globulin were increased and sugar was normal. The fever rose to 103.6 F on the fourth day in the hospital and then gradually dropped to normal two days later. The hyperesthesia of the right lower extremity continued for several days. The paralysis in the right lower extremity became nearly complete and he was able to move only his toes. There was also progressive weakness of the abductors and adductors of the left thigh. Molded plaster splints were applied to both lower extremities.

walked with a considerable limp. The right knee jerk was still absent. In addition he had paresis of the muscles of the left thigh.

In April 1937, nearly four years after the first attack and two years after the second he had made moderate improvement. There was a partial return of function in the right lower extremity, but atrophy of the peronei and of the right quadriceps and a marked right foot drop were still present. Atrophy of the upper abdominal muscles and of the muscles of the anterior wall of the chest were also noted.

CASE 2—First Attack—S L, a white boy aged 9 years had his first attack of poliomyelitis in August 1931, which resulted in paralysis of the right lower extremity.

**Second Attack**—This began Aug 13, 1935, with a temperature of 103 F, headache and vomiting. August 17, when seen by a member of the Meningitis Division, the temperature was 103 F, the neck was stiff and the Kernig sign was positive. The remainder of the physical examination was negative. The spinal fluid contained 65 cells per cubic millimeter, of which 95 per cent were mononuclears. The smear and culture were negative, the albumin and globulin were normal, the sugar was slightly increased. No paralysis developed. The final diagnosis was nonparalytic poliomyelitis.

**CASE 3—First Attack**—J S, a white boy, aged 9 years, had his first attack of poliomyelitis in August 1930 with paralysis of the right shoulder and right lower extremity. The shoulder involvement cleared up but there was some residual weakness in the right foot.

**Second Attack**—Aug 12, 1935, the boy had a temperature of 100.2 F and complained of headache, vomiting and dysphagia. August 14 he was seen by a member of the Meningitis Division. The temperature was 102.6 F, pulse 90 and respiration rate 20. He was irritable and had a stiff neck and the Kernig and Brudzinski signs were suggestively positive. The rest of the physical examination was negative. Lumbar puncture revealed a slightly hazy fluid under normal pressure with 165 cells per cubic millimeter, mostly mononuclears. The smear and culture were negative, albumin and globulin were slightly increased, the sugar was normal. A few days later paralysis of the external rectus muscle of the left eye and paresis of the right thigh developed. Both of these gradually cleared up.

**CASE 4—First Attack**—J K, a white girl, aged 3 years, became ill July 31, 1931. She complained of headache, was drowsy and had a fever of 101 F. August 2 she was seen by a member of the Meningitis Division, who found a temperature of 100.6 F, slight stiffness of the neck and a positive Brudzinski sign. The abdominal and patellar reflexes and the Kernig sign were not elicited. The rest of the physical examination was negative. Lumbar puncture yielded 40 cc of clear fluid under increased pressure. The albumin and globulin were slightly increased, the sugar was normal. There were 2 cells per cubic millimeter. Smear and cultures were negative. A diagnosis of nonparalytic poliomyelitis was made and 20 cc of convalescent human poliomyelitis serum was administered intrathecally. No paralysis developed.

It was felt that, in the presence of an epidemic of poliomyelitis in the community and the absence of other causes, the stiffness of the neck with the increased amount of spinal fluid and albumin made the diagnosis of nonparalytic poliomyelitis likely, in spite of the normal cell count.<sup>3</sup>

**Second Attack**—The onset occurred Aug 23, 1935, with a temperature of 104 F, headache, vomiting and drowsiness. August 26 she was seen by a member of the Meningitis Division, who found a temperature of 102 F. On examination diplopia, stiffness of the neck and a positive Brudzinski but negative Kernig sign were found. The right upper extremity was paralyzed. Thirty cubic centimeters of clear spinal fluid was removed under normal pressure. The albumin and globulin were slightly increased, sugar was present, the cell count was 55 per cubic millimeter, with 95 per cent mononuclears, smear and culture were negative. The diagnosis was poliomyelitis with paralysis of the right upper extremity. Progressive bulbar signs developed and the patient died August 28.

#### COMMENT

Judging from recent reports<sup>3a</sup> it would seem that second attacks of clinical poliomyelitis are more common than has been surmised. At least four cases were seen in the New York City outbreak of poliomyelitis.

3 Levinson S O. Early Acute Anterior Poliomyelitis Without an Increase of Cells in the Spinal Fluid. *J Pediatr* 1: 337 (Sept.) 1932.

3a Te dal Martin. To Ganger Poliomyelitt hos samme Patient med 24 ars mellemrum. *Norsk Mag f Lægevidensk* 95: 978 (Aug.) 1934. Harmon P H and Harkins H N. The Significance of Neutralizing Substances in Resistance and Recovery from Poliomyelitis. *J A M A* 107: 552 (Aug 22) 1936. Neal Josephine B. Personal communication to the authors. Cohen Louis. Anterior Poliomyelitis with Reference to the Occurrence of Two Attacks in the Same Individual. *New England J Med* 213: 601 (Sept. 26) 1935.

in 1935. In three of the four (patients 1, 2 and 4) the first attack occurred during 1931 or 1933 when the disease was prevalent in New York City. Patients 1, 2 and 3 had a first attack that resulted in residual paralysis. In patient 4 the first attack was of the nonparalytic type. Patient 2 had the paralytic form in 1931 and a nonparalytic attack in 1935. A nonparalytic attack may therefore either precede or follow a paralytic attack. One cannot be absolutely certain that the two patients in whom no paralysis developed in one of their attacks were suffering from the nonparalytic form of poliomyelitis. However, these nonparalytic attacks occurred when poliomyelitis was epidemic in New York City. These patients had the same symptomatology as others who were seen in the preparalytic or meningitic stage and later developed muscular paralysis. Neal, who has had a vast experience, felt that there was no good reason to question the diagnoses. The possibility of lymphocytic choriomeningitis and the St. Louis type of encephalitis was also considered. Serum taken from a moderate number of convalescent nonparalytic cases during the summer of 1935 failed to neutralize the virus of choriomeningitis and of St. Louis encephalitis in mice.<sup>4</sup> It is therefore probable that the nonparalytic cases in 1931 and 1935 were poliomyelitis and not some other type of virus meningitis.

TABLE 2—Neutralization Tests (Patient 1)

After Onset of Second Attack	5% Virus	Serum	Monkey
3 days	0.13 cc of 1:4 dilution	0.6 cc	Paralyzed 10 days
21 days	0.13 cc of 1:2 dilution	0.6 cc	Paralyzed 11 days
1 year	0.13 cc of 1:2 dilution	0.6 cc	Paralyzed 7 days

The first attack in our patient was followed by paralysis with nearly complete recovery, the second by extensive paralysis resulting in moderately severe disability. Neutralization (protection) tests were done on serum obtained three days, twenty-one days and one year after the onset of the second attack. The first serum was mixed with a 1:4 dilution of 5 per cent F1 virus suspension and inoculated intracerebrally into a healthy *Macacus rhesus* monkey according to the method previously described.<sup>4a</sup> The mixture produced paralysis and death of the animal on the tenth day after injection (table 2). The blood serum taken on the twenty-first day also failed to protect against a 1:2 dilution of the same strain of virus. A similar result was obtained with serum taken one year after the onset of the second attack, or three years after the first attack. This indicated that three days, twenty-one days and one year after the onset of the second attack the patient had no demonstrable neutralizing substances in the serum against the F1 strain of poliomyelitis virus, though he had survived an attack two

4 Brodie Maurice. Tests of Viruses of Choriomeningitis and Encephalitis (St. Louis) with Serum from Nonparalytic Poliomyelitis (New York City, 1935). *J Infect Dis* 61: 139 (Sept. Oct.) 1937.

4a Of varying dilutions of active 5 per cent virus suspension 0.13 cc was added to 0.6 cc of serum. The mixtures were incubated for two hours at 37 C and then kept in the ice box for approximately two hours. From 0.5 to 0.6 cc of this mixture was inoculated into the frontal lobe of a monkey. The minimal dose used to test the serum in this work was 0.13 cc of a 1:10 dilution of 5 per cent virus suspension. If the serum protected a 1:2 dilution of the virus suspension was used in the next test. Virus neutralizing substance was considered to be present only when a mixture of serum and a 1:2 dilution of 5 per cent virus suspension inoculated intracerebrally failed to produce the experimental disease. Positive and negative controls were made with each experiment. A positive control consisted of a mixture of virus and human serum known to have protective substances. A negative control consisted of a mixture of virus and normal monkey serum without protective properties. The positive control monkey resisted the inoculation. The negative control succumbed with paralysis. Brodie Fischer and Stillerman.<sup>5</sup>

years previously. It must be assumed, therefore, that the protecting substances either were present after the first attack and were lost or, more likely, did not develop at all.

Our failure to demonstrate virus neutralizing substance following the second attack of poliomyelitis corresponded with a similar finding in a large number of serums tested after an initial attack during 1935.<sup>5</sup> We showed that demonstrable virus neutralizing substances often did not develop in the blood serum up to one year after the onset of the disease. It is possible that the absence of these antibodies in the serum is apparent rather than real, since the F1 strain rather than one isolated from the 1935 outbreak was employed as the antigen in most of the tests. However, these strains seemed to be similar, for the results of neutralization tests were identical in all of twenty-five serums tested with both the F1 and the 1935 strains.<sup>6</sup> The results of these neutralization tests suggest that humoral immunity may not take place in human poliomyelitis. One must also consider the fact that the failure to produce humoral antibodies does not necessarily mean lack of immunity, for it is known that some individuals may not develop humoral immunity against certain diseases, owing to a poor mechanism for the formation of antibodies.

The morbidity rate in poliomyelitis is so low that one would expect the incidence of second attacks to be extremely rare, even if no immunity occurs in this disease. Is a small number of second attacks, therefore, evidence of lack of effective immunity? We submitted this problem to Dr Earle B. Phelps,<sup>6</sup> who estimated that 3.4 per thousand new cases of poliomyelitis in 1935 would by chance be expected to have had an earlier attack if such attack conferred no immunity. The upper limit for statistical significance, according to his calculations, was a rate of 1.5 previous attacks per thousand new cases. In other words, if there are more than 1.5 recurrent cases for 1,000 new cases, there is statistically the presumption that complete immunity does not exist. Phelps's analysis was made from the yearly incidence of the disease in a twenty year period in New York City from 1912 to 1931 in the age group 0-20 years and was based on the reported cases of poliomyelitis, most of which were paralytic. In these twenty years, nonparalytic and abortive cases were infrequently recorded.

We have records of four patients who had a second attack of the disease during 1935 in New York City (table 1). Since there were about 2,000 new cases of poliomyelitis in New York City in 1935, the rate for known second attacks in that year was 2 per thousand new cases. This would imply that the number of second attacks in 1935 was within the limits of expectancy if no immunity developed from previous attacks. The figures for the year 1935 however, may not apply to other years in this locality or to other districts in the same year.

Still<sup>1</sup> divided recurrences of poliomyelitis into two groups, those occurring within three months after the onset and those occurring after two years. The former, which he called recrudescences, were those cases in which an exacerbation of symptoms and extension of

paralysis developed from two weeks to three months after the initial infection. They may be due to the reactivation of dormant virus in the central nervous system. Those cases recurring two years or more after the first infection he grouped as true second attacks. Since no second attack had ever been recorded in the interval between the three month and two year periods, he considered two years to be the minimal duration of immunity that followed poliomyelitis. This point of view is in harmony with the common observation that a community visited by an epidemic of poliomyelitis tends to be relatively free from it during the subsequent year. The interval between the first and second attacks in the 1935 cases was two, four, four and five years. Experimentally, however, Flexner<sup>7</sup> recently has been able to reinfect monkeys several months to several years after they had recovered from poliomyelitis. Consequently, he thought the two year immune period proposed by Still to separate relapses from second attacks was excessive.

A possible explanation for the occurrence of second attacks may lie in the work of Burnet and Macnamara,<sup>8</sup> Paul and Trask<sup>9</sup> and Flexner,<sup>7</sup> who have apparently isolated different strains of poliomyelitis virus. These strains have been demonstrated in different epidemics in widely separated localities, from spinal cords in fatal cases or from nasal washings. The strains often differ immunologically from one another in their ability to produce humoral antibodies and to reinfect monkeys who have recovered from an initial attack of experimental poliomyelitis.<sup>10</sup> Toomey<sup>11</sup> and Flexner<sup>7</sup> stated that they were able to reinfect monkeys with homologous strains but that it was easier when they used a different strain than that which produced the first attack.

Neal's cases reported in this paper were brought to our attention following our case presentation at the New York Academy of Medicine. Kramer<sup>12</sup> at that time stated that he could recall six or eight second attacks that he had seen over a period of years, reports of which have not been published. Very likely other authentic unreported cases have been seen. In view of the statistical significance of each definite second attack, it is urged that such cases be placed on record.

#### SUMMARY

1 Four second attacks of poliomyelitis were seen in New York City in 1935.

2 No demonstrable neutralizing (protective) antibodies against the F1 strain were present in the serum three and twenty-one days and one year following the second attack in one patient.

3 The number of second attacks of poliomyelitis in New York City in 1935 was within the expected statistical rate if one attack conferred no immunity.

4 An attack of acute poliomyelitis may not confer effective immunity.

73 East Ninetieth Street—21-23 Barstow Road

7 Flexner, Simon. Reinfection (Second Attack) in Experimental Poliomyelitis. *J. Exper. Med.* 65: 497 (April) 1937.  
8 Burnet, F. M. and Macnamara, Jean. Immunological Differences Between Strains of Poliomyelitis Virus. *Brit. J. Exper. Path.* 12: 57 (April) 1931.

9 Paul, J. R. and Trask, J. D. The Detection of Poliomyelitis Virus in So Called Abortive Types of the Disease. *J. Exper. Med.* 56: 319 (Sept.) 1932.

10 Paul, J. R. and Trask, J. D. Strains of Poliomyelitis Virus. *J. Exper. Med.* 58: 513 (Nov.) 1933. Trask, J. D., Paul, J. R., Heale, Agnes R. and German, W. J. Viruses of Poliomyelitis. *Immunology Comparisons of Six Strains* *ibid.* 65: 687 (May) 1937. Burnet and Macnamara.\*

11 Toomey, J. A. Second Attacks of Poliomyelitis in Macacus Rhesus Monkeys. *Am. J. Dis. Child.* 52: 802 (Oct.) 1936.

12 Kramer, S. D. Personal communication to the authors.

5 Brodie, Maurice, Fischer, A. E. and Stillerman, Maxwell. Neutralization Tests in Poliomyelitis Sera Taken During the Acute and Convalescent Stages of the Disease and Tested with a Passage Virus and a Strain Isolated During the 1935 New York City Outbreak. *J. Clin. Investigation* 16: 447 (May) 1937.

6 Dr Earle B. Phelps, professor of sanitary science, Institute of Public Health, College of Physicians and Surgeons of Columbia University, gave permission to report these statistics.

## Clinical Notes, Suggestions and New Instruments

### CEREBRAL DAMAGE IN A CASE OF FATAL POISONING DUE TO A COMPOUND OF ERGOT AND APIOL (ERGOAPIOL)

KONSTANTIN LOWENBERG MD ANN ARBOR MICH

Numerous cases of apiol poisoning have been reported in recent years. In the majority the symptoms were those of polyneuritis or nephritis. Cerebral involvement has been rare. I here report the changes in the brain in a fatal case.

**History**—E. R., a white woman, aged 20, was admitted to the University of Michigan Hospital in coma which had developed forty-eight hours previously. Four days prior to admission the patient took seventeen capsules of ergoapio<sup>1</sup> to induce abortion. The next evening she became nauseated, collapsed and had convulsions.

**Examination**—The patient was well developed. The lips and mouth were ulcerated and bleeding from continued biting. The breasts were full and firm, and colostrum could be expressed. There were soft systolic murmurs at the apical and pulmonary areas. The abdomen was soft. The introitus vaginæ was slightly congested. There was paronychia of the left great toe. The temperature was 104.6 F (rectal), pulse 150, respiration rate 30, blood pressure 118 systolic, 64 diastolic.

The patient was in a deep coma and made no spontaneous movements except for frequent biting of the lips. There was a generalized mild hypotonia and no stiffness of the neck, the Kernig and Brudzinski signs were negative. There was no reaction to painful stimuli. The pupils were equal and reacted well to light. Both eyes were deviated to the left. The papillæ were hyperemic but there was no choking. Tendon reflexes were present but diminished. Abdominal reflexes were absent.

Forty-eight hours after admission the patient aborted a fetus 15 cm in length. Otherwise there were no essential changes. The temperature remained elevated and the coma continued. The patient kept her eyes open at times but did not respond to questions. Six days after admission the examiner noted drooping of the left corner of the mouth, slight rigidity of the neck and slight increase in the muscle tone of the arms. The legs were flexed at the knees. The tone of the legs and feet was markedly increased and the patient cried when the legs were passively moved. There were no spontaneous movements. There was a bilateral Babinski sign and a bilateral sustained ankle clonus. All tendon reflexes were increased. There was suggested lateral nystagmus when the head was passively rotated laterally.

The patient remained in this condition for three weeks. Twenty-two days following admission the patient was in deep coma and perspired profusely, the temperature rose to 107.8 F, the pulse to 140 and the respiration rate to 40. The next day the pulse rose to 180, the respiration rate to 48 and the temperature to 109.6 F, and the patient died. Death occurred twenty-six days following ingestion of the drug.

#### PATHOANATOMIC EXAMINATION

At postmortem examination there was a recent functional hyperplasia of the breasts, marked acute passive congestion of all organs, terminal right-sided cardiac dilatation, petechial hemorrhages in the lungs, stomach, ileum, kidney, pelvis and urinary bladder, acute edema of the lungs, an involuting placental site in the uterus, acute catarrh of the gastrointestinal tract, subacute ulcerative purulent cystitis, edema of the retroperitoneal tissue, simple and bone marrow giant cell emboli in the lungs and hyperplasia of the spleen and retroperitoneal lymph nodes. The examination with the exception of that of the central nervous system was made in

the Department of Pathology, University of Michigan Medical School, by Prof. C. V. Weller, director.

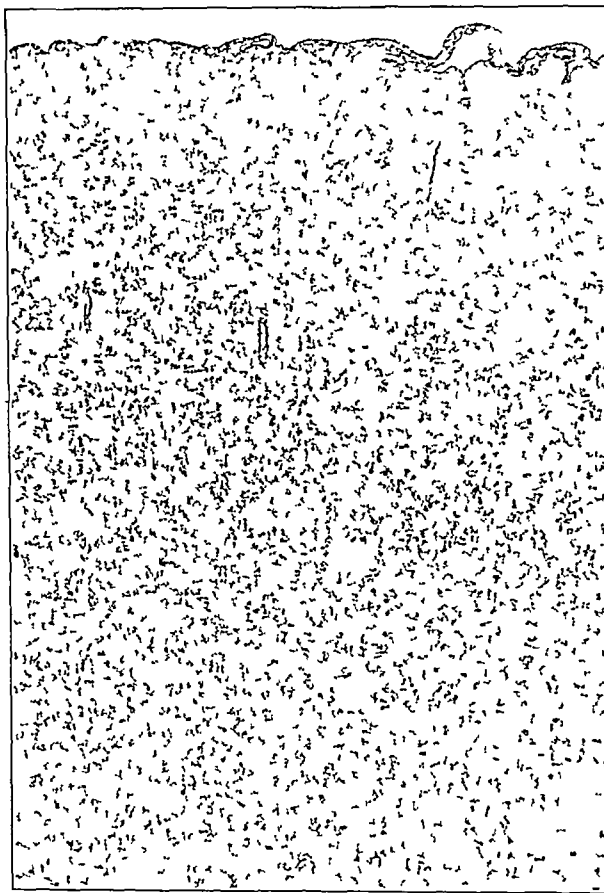
The brain was grossly normal.

Microscopic examination revealed that the leptomeninges contained moderate amounts of polyblasts and lymphocytes and were slightly thickened.

The architecture of the cortex was severely damaged, showing four different types of destruction:

1. Areas in which the entire width of the cortex was destroyed, only a few scattered neurons surviving. There was an abundant glia response, the degenerated areas containing polyblasts and astrocytes. The spongy state was common in the upper layers and the capillaries were increased, as shown in the accompanying illustration.

2. Areas in which only the upper layers of the cortex were destroyed.



All layers of the cortex are destroyed, few neurons (large dark elements) remaining. Small elements are proliferated microglia and macroglia. Parietal lobe. Zeiss Planar 20 mm.

3. Areas in which there was a diffuse degeneration of the neurons in all layers but no glia response.

4. Areas in which the cytoarchitecture was well preserved but the cells showed severe acute degenerative changes.

Destruction of types 1 and 2 involved large parts of the parietal and temporal lobes. Destruction of types 3 and 4 was prevalent in the frontal and occipital lobes.

**Basal Ganglions**—The putamen and the caudatum showed severe and extensive degeneration of the parenchyma.

**Pallidum**—The parenchyma cells were considerably reduced in number and there was a moderate glia reaction.

**Thalamus**—There was extensive degeneration of the parenchyma.

**Hypothalamus**—There was diffuse degeneration of the parenchyma with moderate glia response.

**Brain Stem**—The red nuclei and corpora luyssi showed severe parenchymatous degeneration. In the substantia nigra and geniculate bodies there were moderate toxic changes in the

From the laboratory of neuropathology, State Psychopathic Hospital, University of Michigan Medical School, Raymond W. Waggoner, M.D., director.

<sup>1</sup> Ergoapio<sup>1</sup> is a proprietary medicine containing active principles of ergot and apiol manufactured by the Martin H. Smith Company, New York.

neurons In the corpora quadrigemina, substantia grisea centralis, area reticulata and nuclei of the cranial nerves there was a moderate degeneration of the parenchyma, but the glia was very active The nuclei of the pons and the gray matter of the cerebellum were normal, but the neurons of the nucleus dentatus were reduced in number and the surrounding glia was proliferated

Scarlet red preparations revealed considerable amounts of lipoids in the degenerated neurons, microglia and macroglia An occasional fat-laden gitter cell was observed in the perivascular spaces There was no iron Myelin preparations showed considerable reduction of myelin sheaths in the cortex Axis cylinders were reduced

White matter appeared edematous in Nissl preparations and the oligodendroglia were swollen There was no reduction of myelin

The histologic picture was that of a severe and advanced degeneration of the cortex, the basal ganglions and the brain stem There was a certain selection of areas, the parietal and temporal lobes, parts of the basal ganglions and the brain stem showing particularly severe involvement The changes were degenerative and must be designated as a toxic encephalopathy

## COMMENT

Clinically apiol preparations are known to produce three types of disorder (1) polyneuritis, (2) nephrosis and uremia, and (3) encephalopathy

1 The polyneuritis was produced by an impurity (triorthocresylphosphate) which was found to constitute from 28 to 50

## Average Doses

	Average Dose Gm	Maximum Single Gm	Maximum Daily Gm	Amount Ingested by Patient Gm
Ergot extract	0.5	4	12	1.10
Aloln	0.015	0.12	0.6	0.136
Oil of savin	0.4	1.0	3.0	0.51
Apiol	0.2	1.0	2.0	5.1

per cent of the apiol preparation ingested (Denison and Yaskin,<sup>2</sup> van Italle<sup>3</sup>) It is the same substance that was responsible for the so called Jamaica ginger paralysis and is therefore of no interest here

2 To the "nephritis" group belong the observations of Krakauer,<sup>4</sup> Petri,<sup>5</sup> Laederich, Mamou and Arager,<sup>6</sup> Brule and Lenegre,<sup>7</sup> Trillat and Thiers,<sup>8</sup> and Brenot.<sup>9</sup> Many of these cases were fatal The symptoms appeared from one to eight days following the ingestion of apiol The temperature and the pulse rate were usually elevated, in some cases up to 40 C and 140 respectively Nausea, vomiting, abdominal distress and diarrhea were common, particularly in the early stages Erythematous eruptions of the skin, gingivitis, gangrene of the buccal mucosa and edema of the vulva were frequent There were methemoglobinuria and hemoglobinuria, anuria and symptoms of uremia, the color of the skin was grayish brown or icteric (Krakauer,<sup>4</sup> Trillat and Thiers<sup>8</sup>) The urine was a brown red or almost black and greatly reduced in amount 900 cc,<sup>6</sup> 40 50 cc,<sup>9</sup> or even 10 cc<sup>7</sup> in twenty-four hours In the last instance it contained 5 Gm of albumin In Krakauer's<sup>4</sup> case it contained bilirubin, methemoglobin and hemoglobin but no sugar There were a few casts and polymorphonuclear leukocytes The blood nonprotein nitrogen, urea and uric acid were increased

Neurologic symptoms were common in this group Some of them, such as clonic and tonic convulsions may be due to uremia, while others were apparently of different pathogenesis

Trillat and Thiers<sup>8</sup> reported atrophy of the musculature of all extremities, which developed within three weeks and was not associated with symptoms of polyneuritis or paralysis They noted also a positive Chvostek sign and nystagmus

Patho anatomically, Petri<sup>5</sup> and Krakauer<sup>4</sup> found enlarged spleen and kidneys, the latter being chocolate brown with multiple hemorrhages and small greenish foci Histologically tubuli contorti were plugged by hemoglobin, methemoglobin and detritus, which was slightly calcified The epithelium was moderately damaged There was an outspoken erythrophagocytosis in the spleen The liver showed fatty changes and proliferation of the Kupffer cells In interpreting these observations Krakauer<sup>4</sup> emphasized the significance of methemoglobinuria and hemoglobinuria and regarded the renal changes as secondary

3 The encephalopathic group comprises one case of retrobulbar neuritis<sup>10</sup> and one case of encephalopathy<sup>11</sup> Flandin's patient ingested 8 Gm of apiol within three hours she felt dizzy in the afternoon and became comatose in the evening On admission there was no paralysis, the reflexes were present but the patient did not respond to painful stimuli The temperature was 38.5 C (101.3 F), pulse 100, blood pressure 120 systolic, 70 diastolic, and respiration "normal" There was no albumin in the urine There were clonic tonic convulsions beginning in the face and involving the right lower and both upper extremities, which lasted two hours The next day there was icterus and the urine contained bile pigments, bile salts and a trace of albumin The spinal fluid was normal The coma disappeared after thirty-six hours and was followed by a short period of excitement and mental confusion Four days after admission the patient was oriented and quiet but complained of disturbance of vision In the following four weeks she suffered from retrograde amnesia, which gradually cleared up Five weeks after the ingestion of apiol the patient aborted There was a complete recovery

## CHEMICAL NATURE OF APIOL PREPARATIONS

There are several preparations on the market and their varying pharmacologic properties are not sufficiently known It is therefore impossible to state just what is responsible for the poisoning in each case Few authors have designated the type of preparation ingested According to Heffter<sup>12</sup> fatty changes of the organs, especially of the liver, can be produced by different preparations apiolum viride, myristicine, oleum petroselinum, and crystallized apiol Christomanos<sup>13</sup> came to similar conclusions Disturbances of the central nervous system were produced in animals by Lutz and Oudin<sup>14</sup> following injection of crystalline apiol They noted attacks of excitement, tetanoid contractions, trismus, opisthotonos, protracted convulsions and contractures of the extremities Collapse and coma followed injection of the green or yellow apiol The experimental results are very similar to the clinical picture described by Flandin and by me

In my case I was dealing with a proprietary preparation one capsule of which, according to the company's pamphlet contains ergot extract 0.065, aloln 0.008, oil of savin 0.03 and apiol 0.3 Gm

The average, maximum single and maximum daily doses of these preparations as well as the amount ingested by the patient are given in the accompanying table

As the table shows, the amounts of all drugs with the exception of apiol are considerably below the maximum daily doses, while the amount of apiol is two and a half times the maximum daily dose According to the manufacturer's pamphlet, the apiol used is a camphoraceous body derived from common parsley It is assumed that it is identical with parsley camphor or 1-allyl-2,5 dimethoxy-3,4-methylene dioxybenzene<sup>15</sup> This body was apparently responsible for the damage of the brain in the case reported here

- 2 Denison Robert and Yaskin J C Apiol Polyneuritis J A. M. A. 104 1812 (May 18) 1933  
3 van Italle L. Harmsma A and Esveld L W Arch f exper Path u Pharmacol 165 84 1932  
4 Krakauer Deutsche Ztschr f d ges gerichtl Med 18 626 1932  
5 Petri quoted by Krakauer<sup>4</sup>  
6 Laederich I Mamou H and Arager Mme Bull et mcm Soc med d hop de Paris 18 7-6 (May 30) 1932  
7 Brule and Lenegre quoted by Flandin Nachtr Bernard<sup>11</sup>  
8 Trillat P and Thiers H Ann de med 30 176 (July) 1931  
9 Brenot Pourgoane med 21 July 1 1913

- 10 Juhasz Schaffer A Klin Monatsh f Augenh 80 301 (Sept) 1932  
11 Flandin C Nachtr S and Bernard J Bull et mcm Soc med d hop de Paris 50 967 (June 25) 1934  
12 Heffter Deutsches Arch f exper Path u Pharmakol 127 252 1927  
13 Christomanos A Arch f exper Path u Pharmakol 127 252 1927  
14 Lutz and Oudin Bull et mem Soc de Biol 66 315 1920  
15 Mercet Index 1930 p 80



The amount of apiol ingested is known in few cases. In the uremic group Leaderich's patient took 9 Gm, but the variety was not designated. In the encephalopathic group, Flandin's patient took 8 Gm. This author found no triorthocresyl phosphate in the drug ingested and designated it as a perfectly pure apiol.

I have tested the apiol used in the present case for triorthocresyl phosphate. The experiments were carried out by Mr Watts, assistant pharmacist at the University of Michigan Hospital, and a phosphate radical was found. We are unable to state, however, that we are dealing with triorthocresyl phosphate, since the company did not respond to our request for a sample of the pure material.

#### A CASE OF BENZEDRINE SULFATE POISONING

BENJAMIN APFELBERG, M.D., New York

This case is reported primarily because of the unusual effects of a very large dose of benzedrine sulfate taken by the patient and also because of the fact that there is no record in the literature of a similar case. While instances have been recorded in which toxic manifestations such as cardiovascular disturbances, exhaustion and fainting or else collapse were noted in the more severe reactions, still no case of actual poisoning similar to this one has been described.

##### REPORT OF CASE

A man, aged 29, an elevator operator, was brought to the hospital from his residence Nov 17, 1937, in a comatose state from which he could not be aroused. His family gave the information that he had obtained on a prescription twenty-five tablets of benzedrine sulfate of 10 mg each and that on the same day he was discovered in an unconscious condition. Examination of the bottle which was brought to the hospital by the relatives showed that there were eleven tablets left. Chemical analysis and a check up with the family physician and pharmacist confirmed the information that the drug taken was benzedrine sulfate, and from the facts gathered he had evidently taken 140 mg of the drug in one dose. The family physician stated that the patient was psychoneurotic, he had no organic disease and was not using any other medication aside from the benzedrine sulfate which had been prescribed for his complaints of depression, exhaustion and frequent belching.

The patient's relatives were interviewed and they estimated that he had probably been unconscious for about an hour when at 5 p.m. he was discovered in a bathtub of cold water. He had been complaining of stomach trouble that was the only complaint the patient mentioned, according to the family. When they found him unconscious, the family noted loss of sphincter control and the occurrence of several convulsive attacks.

On admission to the hospital at 11 o'clock he was in a state of collapse, showing symptoms of shock. The patient was well developed and well nourished; the skin was ashy pale, the extremities were cold and clammy, the pulse was not perceptible, the cardiac rate was 60 and the blood pressure was 100 systolic, 70 diastolic. The temperature at the time of admission was 94.4 F and the respiratory rate fluctuated from 18 to 24. There was a small quantity of greenish vomitus. A bloody discharge was noted from both ears, and otoscopic examination revealed both drums moderately injected, with no bulging or perforation. Tremor of the upper extremities and fibrillary twitchings of the muscles of the jaw were observed together with a Babinski sign on the right and a Hoffmann sign on the left. The pupils were midwide and equal and reacted to light. There was no nystagmus.

Subsequent to admission he continued in a comatose state throughout the first night with intervals of restlessness and thrashing about during which he vomited a blood tinged fluid. At 10 a.m. the temperature had ascended to 99 F, the pulse was 68 and the respiratory rate 28. At 4:30 his face became very flushed with a markedly erythematous appearance. His

breathing at this time was stertorous, with a rate of 20. The pulse, which was still 68, was of weak quality. The lips were slightly cyanosed. He was still restless and very stuporous, and contact with the patient was not possible. Painful stimuli aroused him partially. He was incontinent and had difficulty in swallowing. The abdomen was quite distended and he vomited a yellowish fluid.

On repeated examinations the pupils were midwide and equal, reacting to light with marked hippus. Later a spontaneous and rapid hippus reaction was observed. The conjunctival and corneal reactions were uncertain. The fundi were normal; the retinal arteries showing no spasm or hemorrhage. Bilateral Babinski and Oppenheim signs and changing rigidities in the upper extremities were found. Several hours later the spasticity extended to the lower extremities. There was twitching of the facial muscles together with slight grasping of the delirious type. The abdominal reflexes were absent. These neurologic signs disappeared when the patient came out of coma. There was no nystagmus or speech involvement at any time.

About thirty-six hours after admission, the patient came out of coma but was mildly confused, depressed and retarded for a day, after which mental clearness continued. Subsequently he complained of a burning sensation in the stomach, and his gums became soft, red and swollen. At this time he also had herpes of the lips. He could not recall exactly how many benzedrine sulfate tablets he had taken but thought that he might have consumed at least three or four at one time.

As to the blood pressure readings, there was a rise to 134/76 within a few hours after admission and on the 23d, six days after admission, the reading was 140/80. December 6 the blood pressure reading was 106/64. His family physician stated that the patient's systolic blood pressure was generally 90.

November 20, hematuria was noted in a catheterized specimen. The urine was frankly bloody and a microscopic examination revealed innumerable red blood cells. All other urine tests had been negative except the first one, which had 2 per cent dextrose, 2 per cent albumin, a trace of acetone and no white blood cells or casts following the emergency use of 50 cc of 50 per cent dextrose intravenously.

On the third day after admission pneumonia developed, it was not very severe and he recovered without complications. The temperature rose to 103.8 F and there was a blood streaked tenacious sputum which revealed type VI pneumococcus.

Shortly after admission the white cell count of the blood was 7,750 per cubic millimeter with 83 per cent polymorphonuclear leukocytes, 11 per cent lymphocytes and 6 per cent transitionals, red blood cells numbered 4,790,000. Hemoglobin was 95 per cent. Blood sugar was 108 mg per hundred cubic centimeters, chlorides of the blood were 483, nonprotein nitrogen was 18, and the carbon dioxide combining power was 44 volumes per cent. These readings were obtained twelve hours after admission. The first spinal tap which was clear and under normal pressure, showed 15 cells with no increase in sugar and no globulin. Colloidal gold and Wassermann reactions of both the spinal fluid and the blood were negative. Chemical analysis for bromides and barbiturates was negative. The electrocardiogram showed a normal condition. X-ray examination of the lungs revealed no consolidation or pressure of fluid.

In the beginning the patient was given the routine therapy for shock, such as 5 per cent dextrose in saline solution intravenously and administration of oxygen by nasal catheter. After the coma had subsided moderate doses of chloral hydrate were required for four nights because of restlessness and insomnia.

At present aside from four subcutaneous abscesses which had developed November 27, he has made a complete recovery. There is an amnesia for most events just prior to admission to the hospital. He is unable to recall exactly how much of the medication he took but thinks he swallowed a good many tablets at least three or four. The last thing he remembers when he woke up in the hospital was taking these tablets, stating that he took them primarily for stomach trouble, which consisted of frequent belching. For the past two years he



relates that he had been depressed because of anxiety over his practice of masturbation, which he believed was drying up his brain and his skin. At first he had admitted that he took the overdose of benzedrine sulfate because he wanted to die, but later he changed his story, insisting that he thought the more he took the sooner he would obtain relief from his gastric symptoms. From time to time he complained of exhaustion, insomnia, loss of energy and poor appetite, all of which he attributed to the effects of masturbation. From a psychiatric standpoint the patient displayed the characteristics of the psychoneurotic subject with a transitory period of depression.

#### REVIEW OF THE LITERATURE

Davidoff and Reifstein<sup>1</sup> have reported administering as high as 70 mg of benzedrine sulfate without effect in some of their unresponsive patients. Peoples and Guttman<sup>2</sup> gave doses of from 10 to 80 mg to twenty-five persons, noting usually a rise in blood pressure and pulse rate with no other cardiovascular phenomena. Solomon and his two co-workers<sup>3</sup> have reported that one of their patients suffering from postencephalitic Parkinson's disease was able to take 160 mg a day for three weeks without any untoward results. Apparently this amount was taken in divided doses. Idiosyncrasies to smaller doses and also resistance to higher amounts in some neurologic conditions are apparently factors influencing psychosomatic reactions in different individuals. Davidoff and Reifstein<sup>1</sup> mention in their series that one of their patients treated with benzedrine sulfate was given as much as 200 mg in one day, apparently in divided doses, without any greater reaction than that experienced after a dose of 20 mg.

Although the minimum lethal dose of benzedrine hydrochloride has been found to be 25 mg for each kilogram of body weight of rats, according to Hartung and Munch,<sup>4</sup> nevertheless the extreme severity and the gravity of the symptoms presented by this patient would suggest that the ratio method, even with idiosyncrasies considered, is not an accurate guide in computing lethal doses based on experimental results with animals. This would especially be true in a substance like benzedrine, which may give similar reactions following widely differing doses. Anderson and Scott<sup>5</sup> describe a case presenting very severe cardiovascular symptoms following the use of 30 mg of benzedrine sulfate. This patient, who was suffering from involutional depression with paranoid ideas, became dyspneic and flushed two and a half hours after the benzedrine sulfate was taken. Several hours after that there was collapse, cyanosis, clamminess and a slowing of the pulse to 56 with a drop in every fourth beat. In making a review of the literature they state that nowhere else did they find such severe cardiovascular effects.

Some of the reactions described in this case correspond to the well known effects produced by benzedrine, such as increase of blood pressure, decrease of pulse rate, relaxation of tone of the gastro-intestinal tract and various other effects associated with vasoconstrictor action on the vasomotor system. On the other hand, the extremely severe symptoms noted in this patient, such as convulsions, coma, hematuria, signs of strong irritation of the central nervous system, congestion of the ear drum and precipitation of a pulmonary infection resulted from an unusually large dose heretofore not reported by others.

Alles,<sup>6</sup> in experimenting with various phenyl and hydroxy phenyl propylamines on guinea pigs to which lethal doses had been administered describes the occurrence of acute signs in two hours manifested by mydriasis and generalized tremors

which are followed by clonic convulsions. Gross postmortem examination more regularly showed hemorrhage of the lungs or spleen in animals dying from doses of the phenyl derivatives (benzedrine) and phenylethylamine than in those dying from doses of the hydroxyphenyl derivatives.

#### CONCLUSION

This case demonstrates the fact that, although this patient recovered completely, nevertheless the grave symptoms would indicate that benzedrine sulfate may become lethal, at least in certain individuals, in far smaller doses than those computed by experimental ratios deducted from its effects on animals. It is also interesting to note that there is apparently a relationship between the extreme vasoconstriction in the autonomic system brought on by large doses of benzedrine sulfate and the convulsive attacks experienced by this patient.

First Avenue and Thirtieth Street

#### A CASE OF OCHRONOSIS

EDWIN SEABORN, M.D., LONDON, ONT.

Some three years ago a man, aged 70, with dusky complexion and deep set eyes, presented himself for examination. He complained of general weakness, vague digestive disturbances, stiffness in the larger joints and spine and some precordial pain radiating to the left arm.

The stiffness was moderate in the hips and knees, greater in the shoulders and complete in the lower part of the thorax and lumbar region. The heart was normal in size and sounds. There was moderate enlargement of the spleen and moderate enlargement and tenderness of the liver. The cartilages of the nose and ears were quite dark, rendered darker by pressure. The cartilages of the knuckles were dark, rendered darker by tightly closing the fist. The glands of the villae and gums were moderately enlarged. To each side of the pupils there was a dark spot with ragged penciled borders and a diameter something less than 1 cm. Manipulation of the eyelids showed that these spots were in the sclerotics. As the eyes were deeply set, these spots had not come to the attention of the patient. Physical examination revealed no other abnormalities.

#### Amount of Homogentisic Acid in Urine

	Cc	Gm in 100 Cc	Specific Gravity
Ordinary run			
Volume	680		1.00
Homogentisic acid		0.161	
Total nitrogen		1.01	
High protein diet			
Volume	700		24 hours
Homogentisic acid		0.210	1.07
Total nitrogen		1.17	
Carbohydrate diet			
Volume	810		1.071
Homogentisic acid		0.170	
Total nitrogen		0.80	

Chemical analysis by Dr. A. Bruce Macallum, Research Department, University of Western Ontario Medical School.

The blood count showed erythrocytes 4,400,000 per cubic millimeter, hemoglobin 75 per cent (Newcomer), leukocytes 4,000 per cubic millimeter, color index 0.87, eosinophils 1 per cent, neutrophils 51 per cent, large lymphocytes and large mononuclears 6 per cent, small lymphocytes 42 per cent.

The red blood cells were rather hypochromic but did not appear to vary abnormally in size or shape. There was some leukopenia with a relative lymphocytosis.

The blood sugar varied from 80 to 120 and nonprotein nitrogen 39.7 to 48 mg per hundred cubic centimeters. The blood group was IV (Moss). The blood pressure was 80 systolic, 120 diastolic. The basal metabolic rate was minus 3.

Dr. Harold Wismer reported as follows on the x-ray studies. The whole skeleton showed osteoporosis not indicative of any condition other than senility as far as was seen in the films. The lumbar spine both glenoid cavities and the knee joints showed osteoarthritis. The left humerus showed some periosteal thickening about the attachment of the deltoid and to a

1 Davidoff Eugene and Reifstein F. C. Jr. The Stimulating Action of Benzedrine Sulfate. *J. A. M. A.* 108:1770-1776 (May 22) 1937.

2 Peoples S. A. and Guttman J. Hypertension Produced with Benzedrine. Its Psychological Accompaniments. *Lancet* 1:1107-1109 (May 16) 1936.

3 Solomon Philip, Mitchell R. S. and Prinzmetal Myron. The Use of Benzedrine Sulfate in Postencephalitic Parkinson's Disease. *J. A. M. A.* 108:1765-1770 (May 22) 1937.

4 Hartung W. H. and Munch J. C. Amino Alcohols. VI. The Preparation and Pharmacodynamic Activity of Four Isomeric Phenylpropylamines. *J. Am. Chem. Soc.* 53:1875-1879 (May) 1931.

5 Anderson E. W. and Scott W. C. Cardiovascular Effects of Benzedrine. *Lancet* 2:1461-1462 (Dec. 19) 1936.

6 Alles G. A. The Comparative Physiological Actions of di-P-phenylpropylamines. I. Pressor Effect and Toxicity. *J. Pharmacol. & Exper. Therap.* 47:339 (March) 1933.

lesser degree on the internal margin above the level of the deltoid attachment. The intervertebral disks showed a patchy condensation, which may be common in the condition under study. The spleen was enlarged. No other abnormality was seen.

An electrocardiogram was interpreted as showing a sinus arrhythmia, with an approximate rate of 72. Auriculoventricular and intraventricular conduction times were normal. The physiologic condition of the heart muscle was good. There were, in fact, no essential variations from the normal.

While the urine is dark and smoky, suggesting the presence of blood, no erythrocytes are seen microscopically, and only a trace of albumin is present. The urine, with a specific gravity sometimes attaining 1.030, reduces Fehling's solution in a peculiar manner, the solution becoming black and the precipitate unusually brown. These peculiarities suggest the presence of homogentisic acid. The fermentation test is negative for sugar.

As each drop of a weak solution of ferric chloride strikes the urine it forms a ring of blue, which rapidly disappears. The urine, already dark, turns black in the presence of any alkalinizing agent. It does so also on becoming ammoniacal from standing some time. I noted that, if the urine is allowed to stand undisturbed in a bottle, a dense area first appears in the upper part and then the black area becomes thicker until it reaches the bottom of the urine.

The presence of the homogentisic acid, with the peculiar discolorations noted, proved that the patient is suffering from ochronosis.

The amount of homogentisic acid varies with the diet, being higher on a high nitrogen diet than on a low nitrogen diet, as shown in the accompanying table.

Watery extracts of the feces showed no homogentisic acid, the mucous membrane of the intestinal tract apparently not excreting this substance.

Three rabbits and three guinea pigs each injected with 15 cc of the urine, showed no effects, and homogentisic acid did not appear in their urines.

The patient, the tenth of thirteen children, was born at seven months. The four other surviving members of the family ascribe his condition to his premature birth, saying that the mother, while carrying him, was overworked at the time of the family's removal from the old log house to their new home.

His two elder surviving sisters stated that as young girls they had assisted in doing family washings for several years and knew that his urine from infancy had stained his clothing, which required more washing than any other. Even when bleached in the sun they never became quite white. They knew that even at birth his diapers were stained in this way. They stated that the clothing of no other member of the family had this staining quality. They had not noted any darkening of the ears or eyes and believe that they would have noticed this, as they were very much interested in the small baby whom the mother carried about on a pillow.

The patient was married at 22. His wife stated that she at once noticed the staining qualities of the urine. He became sensitive and was much distressed about it. At 34 he had typhoid, recovering slowly and he believes imperfectly. As he was recovering his wife noticed that his ears were a leaden color and progressively became darker. After typhoid the spine progressively stiffened.

A small piece of cartilage was removed from the ear. The blackening, which affected the cartilage but not the perichondrium, was quite apparent, and has the quality of newly shined boots, as described in autopsies. The pigment could not be made out in frozen sections.

Of a family of thirteen, the patient two younger brothers and two elder sisters survive. All had children except two brothers who died before they were married.

I examined the five survivors of the first generation, and all the descendants of the thirteen brothers and sisters with the exception of three, G. T. Jr. of San Francisco, examined by Dr. Alexander G. Bartlett, A. McK. R. of St. Louis examined by Dr. Alfred Goldman and K. L. of Pickle Creek, Ont. examined by Dr. E. Skelton Connor. I made special journeys to many places, including Detroit, Cleveland and Vancouver.

The total number of descendants in the direct line were 135. Five of the first, twenty-six of the second, eighty-two of the

third and twenty-two of the fourth generation. One man in the second generation died in Toronto General Hospital and was said to have had black spots on his body. The assistant superintendent reported his case as follows:

"This patient was admitted here on Nov. 1, 1923, and died December 8. All his signs and symptoms pointed to myocardial disease, with failure. He had over his chest and outer condyle of the right femur petechial spots which faded and became brownish in color. The clotting time of his blood was five minutes."

Beside those of the direct line, I examined seventy-one descendants of the cousins of the patient. In no case whatever, with the exception of the man in question, was there any sign of ochronosis seen by physical examination.

The urine of every person mentioned in this paper, without exception, was examined by the Institute of Public Health of London, Ont., and in no other case than that of the patient was homogentisic acid found.

The patient illustrates what is probably the typical course of a case of ochronosis: urine that is peculiar during the whole course of life, discoloration of cartilages, which appears only very gradually and is first seen in adult life, discoloration of the cornea, which appears in later life, spinal involvement, which also appears late.

The case is of especial interest because of the length of the history obtained and the number of relatives examined.

469 Clarence Street

## Special Article

### NEW SERIES OF ARTICLES ON VITAMINS

MORRIS FISHBEIN, M.D.  
CHICAGO

*This article and others to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed.*

### INTRODUCTION

The achievements in the science of nutrition which have developed in recent years are among the most significant of all that have been made in modern medical science. The original five letter alphabet for the vitamins has been greatly extended and even the original letters have begun to be subdivided. Vitamin B, instead of being just one or two vitamins, may actually include eight or more different specific principles.

Throughout the world the tendencies of research in vitamins incline largely to efforts which contemplate the isolation of vitamins in pure form and the synthesis of vitamins when possible. At this writing at least nine compounds having the properties of vitamins have been isolated and at least four have been synthesized.

In a previous survey of progress in this field it was found necessary to warn the public and the medical profession against the commercial exploitation of individual vitamin preparations and particularly against the promotion of mixtures of vitamins as panaceas. The Council on Pharmacy and Chemistry is still convinced that for the present there seems to be no more logical basis for including a variety of vitamins in one preparation than there is for combining a number of other well known dietary essentials in a single pharmaceutical product. Since, however, vitamins A and D occur together in nature and particularly since it has

been customary now to give them together in the form of cod liver oil or halibut liver oil with added vitamin D, the Council will accept products containing these two vitamins

The articles which follow represent the views of a considerable number of authorities who have endeavored to summarize the available knowledge concerning certain phases of vitamin study. The average reader will probably be impressed by the fact that studies of the vitamins are concerned not only with the human being but also and particularly with the diets of numerous animals, including rats, dogs, pigeons and chickens. Indeed, some of the investigations made in animals have been highly indicative of new therapeutic investigations related to human disease. However, these investigations indicate as well that it is not possible to argue *a priori* that a vitamin will produce effects in a human being just because it has produced these effects in an animal with a dietary deficiency.

Coincidental with the appearance of this series of articles comes the new edition for 1938 of "New and Nonofficial Remedies," the official publication of the Council on Pharmacy and Chemistry. In the article on vitamins which appears in that publication, each of the vitamins is discussed as to the available knowledge concerning its identity. With this discussion appears a statement as to the claims allowable for the vitamin both in preventive medicine and in therapeutics. These claims represent a summary of our present knowledge. This summary is here appended as a useful guide to those who like their vitamin knowledge in tabloid form.

#### VITAMIN A

*Allowable Claims*—1 Evidence for the existence of vitamin A and its role in human nutrition is based on the fact that a characteristic eye disease, usually called xerophthalmia, results from a deficiency of this vitamin.

2 It is generally agreed that the first symptom or at least one of the first clinical symptoms of vitamin A deficiency is night-blindness, or nyctalopia. For this type of night blindness vitamin A is a specific. Cases of nyctalopia exist which do not respond to treatment with vitamin A. These may be due to congenital defects or to other diseases than avitaminosis "A."

3 Present indications are that vitamin A is an aid toward the establishing of resistance of the body to infections in general only when there has been an exhaustion of body reserves of the vitamin and the ingestion of vitamin A is inadequate. It certainly has not been shown to be specific in the prevention of colds, influenza and such infections, nor has it been demonstrated that ingestion of vitamin A far in excess of that necessary for normal body function and readily obtained from a properly selected diet is an aid in preventing various types of infections.

4 A deficiency of vitamin A results in a retardation of growth when body stores of the vitamin have been depleted, but it must be borne in mind that vitamin A is no more important in contributing to normal growth than any one of the other vitamins, the essential mineral elements, or amino acids. Statements conveying the impression that vitamin A is more important in promoting growth than other food essentials are therefore considered misleading and objectionable.

5 There is at the present time inadequate evidence to warrant the claim that the ingestion of sufficient vitamin A will prevent the formation of renal calculi in man.

#### VITAMIN B<sub>1</sub> THIAMIN CHLORIDE

*Allowable Claims*—1 *Vitamin B<sub>1</sub> is of value in correcting and preventing beriberi.*

The consensus of the students of beriberi is that this disease is due primarily to an insufficient supply of vitamin B<sub>1</sub>. There are conditions which probably could be designated as latent

beriberi", it does not seem wise at this time to attempt the formulation of a definite statement covering such conditions other than that presented in item 7.

2 *Vitamin B<sub>1</sub> may be cited as of value in correcting and preventing anorexia of dietary origin in certain cases.*

There are many causes of anorexia, some referable to infections and the reactions thereto, others to organic disorders, and still others related to faulty diet. Where there is no rather obvious cause of anorexia in question, other than a possible dietary one, it is permissible to claim that vitamin B<sub>1</sub> may be of therapeutic value when the condition to be treated is due to a deficiency of that vitamin.

3 *Vitamin B<sub>1</sub> is of value in securing optimal growth of infants and children.*

Citations in the literature support the claim that a suboptimal supply of vitamin B<sub>1</sub> results in limitation of growth.

4 *Because vitamin B<sub>1</sub> is a dietary essential its administration in concentrated form is of value in some conditions in which difficulty in utilizing ordinary foods in the usual way is encountered.*

The present status of research on the clinical use of vitamin B<sub>1</sub> for specific diseases other than beriberi and for infant feeding is such that definite claims for therapeutic value in relation to such diseases cannot be recognized. Its use may be indicated, however, in such restricted conditions as pernicious vomiting of pregnancy, tube feedings through a jejunal fistula, and the like, because the above permitted statement applies to such conditions and gives an intelligent basis for such therapy.

5 Claims for concentrates of vitamin B<sub>1</sub> offered for clinical use should state the potency in terms of the International unit. The term "concentrate" or a synonym will not be recognized if the product does not exceed a potency of 25 International units per gram (or per cubic centimeter), or if it is a natural product which may have been subjected to a process of dehydration.

6 In connection with medicinal foods acceptable for N N R, the claim that a food is valuable because of its vitamin B<sub>1</sub> content may be made only if it provides in the quantity of food consumed daily at least 200 units of vitamin B<sub>1</sub>.

Any food preparation having less than such an amount cannot be regarded as a noteworthy medicinal source of the vitamin. In the light of present knowledge the daily requirement for vitamin B<sub>1</sub> appears to be not less than 50 units (International) for the infant and 200 units (International) for the adult.

7 There are many experimental indications in the literature suggesting other possible functions of vitamin B<sub>1</sub>, e. g., an influence on intestinal motility and neuritis of various types, and also indications of greatly augmented requirements when metabolism is increased as in hyperthyroidism, neuritis of various types or infections. It seems too early to permit advertising claims for these conditions.

#### VITAMIN C CEVITAMIC ACID

*Allowable Claims*—1 Definite claims for the therapeutic value of vitamin C should be permitted only in relation to scurvy until further clinical or experimental evidence has substantiated its usefulness in other states.

2 Vitamin C is acceptable for the correction and prevention of scurvy. This effect has been established experimentally and by clinical investigation.

3 It may be permissible under certain conditions to refer to the therapeutic value of vitamin C in early and latent scurvy. Convincing clinical evidence has established that this state does occur. It would be well to emphasize the fact that the diagnosis rests, however, on the basis of roentgenologic evidences in the long bones, and possibly failure to excrete an optimum amount of cevitic acid in the urine.

4 Dental caries, pyorrhea, certain gum infections, anorexia, anemia, undernutrition and infection alone are not in themselves sufficient indications of vitamin C deficiency but according to experimental and clinical investigation they may be concomitant signs of vitamin C deficiency. Therefore it would be permissible to accept the claim for the therapeutic value of vitamin C in these symptomatic conditions only when it is definitely

stated that they are the consequences of a deficiency or suboptimal amount of vitamin C or when there is a pathologic interference with assimilation of the amount necessary for the preservation of health

5 Unless more convincing evidence is present than is now available no claim referable to the anti-infective effect of vitamin C will be recognized. Secondary infections are characteristic of disturbances of nutrition, particularly in all vitamin deficiency diseases. It has not been established that vitamin C has a therapeutic effect which directly influences associated secondary infections in scurvy.

6 Because vitamin C is a dietary essential, its administration in concentrated form is of value in conditions where difficulty in introducing orally or utilizing ordinary foods in the usual way is encountered. Vitamin C (cevitamic acid) is accepted as an essential dietary constituent in infant feeding but it should not be accepted for use in the treatment of diseases except according to the conditions mentioned above. It is generally administered in the form of a vitamin C carrying juice. When there is persistent vomiting, diarrhea, or any other condition preventing its utilization in proper amounts it would be permissible to give vitamin C parenterally in concentrated form as sodium cevitamate.

7 Concentrates of vitamin C offered for clinical use must state the potency in terms of the International unit. The International unit for vitamin C, which was formerly defined as the vitamin C activity of 0.1 cc of lemon juice, has now been defined as the vitamin C activity of 0.05 mg of l cevitamic acid (ascorbic acid). This is the quantity of l cevitamic acid usually found in 0.1 cc of lemon juice.

8 The claim that a food is valuable because of its vitamin C content should be permitted only if it provides a daily intake of at least 250 units of vitamin C.

9 A reasonable general statement regarding allowable claims for vitamin C would be as follows:

An optimum amount of vitamin C should be supplied at all ages for its therapeutic value in preventing the development of acute or latent scurvy.

Claims for the therapeutic value of vitamin C may be accepted when the agent is described as a corrective measure for scurvy due to a demonstrable absence or a suboptimal quantity in the diet, or in cases in which it is definitely known that there is interference with the absorption of an optimal amount.

Advertising of vitamin C for such symptoms as failure to gain in weight or stoppage of growth, anorexia, anemia, infections, symptoms referable to the central nervous system or hemorrhagic conditions cannot be accepted unless it is definitely stated that the symptoms are referable to a demonstrable deficiency of vitamin C.

#### VITAMIN D

*Allowable Claims*—1 Vitamin D is recognized as a specific in the treatment of infantile rickets, spasmophilia and osteomalacia, diseases which are manifestations of abnormal calcium and phosphorus metabolism. Vitamin D is valuable in the prevention as well as in the curative treatment of these diseases. Complications such as renal insufficiency or glandular malfunction may preclude normal response to vitamin D therapy. During acute infections, especially of the gastro-intestinal tract, vitamin D may prove ineffective because poorly absorbed.

2 Direct exposure of the skin to ultraviolet light from the sun or from artificial sources results in the formation of vitamin D within the organism but the Council cannot recognize statements or implications that vitamin D has all beneficial effects of exposure to sunshine.

3 There is clinical evidence to justify the statement that vitamin D plays an important role in tooth formation and maintenance of normal tooth structure, but there is no warrant for the claim that adequate vitamin D intake will insure normal tooth structure or that adequate vitamin D intake will prevent dental caries.

4 Animal experimentation has shown that correction of an inadequate intake of vitamin D results in the more economical utilization of calcium and phosphorus and also that the undesirable effects of improper ratios of calcium and phosphorus in the diet can largely be overcome by normal intake of vitamin D.

The importance of these observations in their application to man is not entirely apparent because of the lack of adequate clinical evidence showing the availability of different forms of calcium and phosphorus, but it may be stated that vitamin D has a favorable influence on calcium and phosphorus metabolism.

5 The vitamin D requirement is greatest during the period of infancy. Beyond the age of infancy the exact vitamin D requirement of man under any specified conditions is not known but it appears that the requirement during pregnancy and lactation is increased.

## Therapeutics

### THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.

CHICAGO

*NOTE*—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed the series will be published in book form.—Ed.

#### THE THERAPY OF HEMOPTYSIS

IN COLLABORATION WITH DR. FREDERICK TICE

Only frank hemoptysis will be considered here, as mere blood-tinged or blood-streaked sputum, occurring as it does in a great many conditions, does not require any other treatment than that of the underlying disease.

In hemoptysis the blood is bright red, frothy, alkaline, mixed with mucus or pus, and of salty taste. It must be remembered, however, that blood coming from the lungs may have been swallowed and vomited after having been altered by the stomach. Wounds of the chest, diseases of the lungs, especially carcinoma or abscess of the lung, diseases of the bronchi, the heart or the large vessels (especially aneurysm), and hemorrhagic disease (q v) may all cause hemoptysis, but pulmonary tuberculosis (q v) is so far the most common cause that the expectoration of any considerable amount of blood should be considered to mean tuberculosis unless or until it is proved otherwise. The next most common causes are mitral stenosis (q v) and bronchiectasis (q v). The heart should always be examined to determine whether mitral stenosis is present. While prolonged physical examination should be avoided during active hemorrhage, subsequently most careful physical, roentgen and laboratory examinations should be insisted on.

#### PROPHYLAXIS

The correct treatment of pulmonary tuberculosis (q v), most especially by pneumothorax, is the best prophylactic for hemoptysis. One must remember that the tendency to hemoptysis is greatest when the apparently convalescent patient feels best. Hence, extra precautions are required at this time. A patient predisposed to hemoptysis should be warned against sunbaths as well as overheating, because cases of hemoptysis are more common during heat waves. It is also desirable to protect tuberculous patients, so far as possible, from secondary infection with pneumococci and pyogenic micro-organisms, as sometimes hemoptysis seems to appear in almost epidemic form.

## TREATMENT

The treatment must envision the fact that the loss of blood itself will not be fatal, since the pulmonary blood pressure is only one third of the systemic pressure. In extreme cases the patient will faint and choke from aspirated blood. In less extreme cases he may die from inflammation of the lungs, tuberculosis and the like. If no further symptoms follow the hemorrhage, the bleeding itself is not of much importance.

## GENERAL REGIMEN

In all cases of hemoptysis the patient should go to bed until the bleeding has stopped. The patient should lie in bed with the upper part of the trunk raised and turned to the bleeding side, if it is known from which side the blood comes, to lessen liability of aspiration of blood into the less affected side. Everything possible should be done to allay the excitement of the patient and of those surrounding him. All visitors should be excluded and the patient assured that death from the loss of blood is out of the question. The patient should be encouraged to expectorate freely and frequently, but without straining himself by coughing with the glottis open, as though exhaling forcibly. Bowel movements should be kept soft by saline cathartics. If required, enemas may be used to prevent straining at stool.

## ADDITIONAL INDIVIDUALIZED THERAPEUTICS

In the individualization of correct additional therapeutic tactics, three degrees of frank hemoptysis may be recognized: (A) moderate, (B) severe and (C) pernicious. There is nearly always a tendency to overestimate the amount of blood lost.

*A Moderate Hemoptysis*—1 General Regimen. This has already been considered.

2 Sedation. Sedatives are indicated to the extent to which they lower systemic blood pressure by lessening excitement, but they must not be used to stop coughing. Therefore the commonly employed opiates probably have no place in the treatment of hemoptysis unless used in very small dosage, e.g., 5 mg (one-twelfth grain) hypodermically, if coughing is very excessive. If more is given, the patient will certainly cough up less blood but will retain more of it in his lungs with

## PRESCRIPTION 1—Bromide with Phenobarbital

℞ Potassium bromide	10 Gm
Elixir of phenobarbital	to make 60 cc
Teaspoonful in water every two to four hours	

## PRESCRIPTION 2—Bromide, Phenobarbital and Hyoscyamus

℞ Potassium bromide	10 Gm
Tincture of hyoscyamus	15 cc
Elixir of phenobarbital	to make 60 cc
Teaspoonful in water every four hours	

## PRESCRIPTION 3—Calcium Lactate

℞ Calcium lactate	30 Gm
1 cc of	
Level teaspoonful in water every two hours	

harmful after-effects. It is safer to use bromide, possibly with the addition of a small dose of phenobarbital (prescription 1) to lessen excess of coughing.

3 Reducing of Fluid. Lessening quantity of circulating fluid by giving no food or fluid for twenty-four hours, excepting possibly ice pellets for the psychic effect and to keep the tongue moist, is recommended. Then a moderately dry diet for a few days may be used. Giving sodium chloride in subemetic (teaspoonful) doses may be of some use as an emergency house-

hold remedy. Intravenous injection of 10 cc of 10 per cent solution of sodium chloride or from 50 to 100 cc of 25 per cent solution of sucrose is a more effective means of osmotherapy.

4 Deprivation of Blood. Determination of blood to the skin may possibly do some good, as by means of atropine sulfate 0.6 mg or by adding Tincture of Hyoscyamus (1 cc) to the aforementioned sedative (prescription 2). The nitrates have been found to be of little value. Emetine hydrochloride (a 1 cc ampule 0.06 Gm) hypodermically is considered almost specific in moderate or even severe types of pulmonary hemorrhage. The beneficial effects may be due to dilatation of the splanchnic blood vessels with reduction in pulmonary blood pressure.

5 Coagulability of Blood. Increasing coagulability of the blood may possibly be attempted by giving calcium, as in the form of calcium lactate (prescription 3) when no other medicament is indicated. If it does no good it will at least do no harm. If the hemoptysis is due to hemorrhagic disease (q.v.), the administration of suitable hemostatic is of importance. In view of the pathologic condition of the tuberculous hemoptysis, bleeding from a blood vessel with infiltrated and degenerated walls, little can be expected from hemostatics.

6 After-Treatment. After a hemoptysis the patient must remain in bed and have pulse, temperature and blood sedimentation rate observations made, to be used as an index of the activity of the tuberculous process and as a guide in determining further action.

*B Severe Hemoptysis*—The following additional measures must be employed, if the loss of blood seems alarming: 1 General Regimen. This should be followed as has been suggested.

2 Sequestration of Blood. Apply constriction to both thighs sufficient to occlude venous but not arterial circulation. The pulse should still be perceptible and the patient feel no pain. Leave the bandage in place for half an hour and then apply to the arms for half an hour. Meanwhile preparations are made for the next step.

3 Pulmonary Collapse Therapy (Pneumothorax). This should be instituted on the affected side. Immediate cessation of the hemorrhage rewards its successful establishment. Usually from 500 to 800 cc of air produces sufficient collapse to check a severe hemorrhage. If extensive adhesions prevent collapse, pneumolysis, phrenicectomy or even thoracoplasty may become indicated by continuance of the hemorrhage.

4 Blood Transfusion. If the patient has lost a considerable amount of blood, 500 cc of compatible human blood should be infused slowly (drop by drop) and the injection repeated as required. If blood transfusion is not possible, one might resort, to tide the patient over a crisis, to autotransfusion by elevation of the foot of the bed and by bandaging the limbs tightly from the tips up. Stimulants should be withheld, excepting when the patient seems to be dying.

*C Pernicious Hemorrhage*—Bleeding from a large blood vessel is usually fatal from choking within a few minutes. The physician usually finds the patient dead, drenched with his own blood. If the physician arrives on the scene while the cyanotic patient is still breathing, there is but one thing to do and that should be resorted to promptly. This is to make the patient vomit by tickling the back of the throat. If the emetic movements help to clear the bronchi of blood, enough time may be gained to employ other treatment.

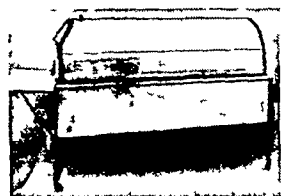
## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION  
OF THE FOLLOWING REPORT HOWARD A. CARTER Secretary

### GENERAL ELECTRIC FEVER CABINET ACCEPTABLE

Manufacturer General Electric X-Ray Corporation, Chicago  
The General Electric Fever Cabinet is designed to be used with the Inductotherm<sup>1</sup> for maintaining heat during fever treatments. It does this by preventing excessive loss of heat from the patient's body, which rests in the cabinet during treatment. The patient's head protrudes through a rubber collar and rests on a pillow. By means of a fan, heater and water container (fillable from the outside) the temperature and humidity within the cabinet are maintained at the desired level. The temperature within the cabinet is read on a thermometer mounted on the outside. Two sliding panels on the front side provide a convenient way for the operator to determine rectal temperatures as well as attend to the needs of the patient. The lid of the cabinet lifts easily, being counterbalanced by weights.

Because of the size of the unit, it will accommodate both adults and children. Its dimensions are length, 85 inches (without Inductotherm) or 110 inches (with Inductotherm in place), height (to top of columns), 64½ inches, or 50 inches (to top of cabinet), net weight (without Inductotherm), 370 pounds, or shipping weight of 420 pounds. The cabinet is made of an aluminum alloy and contains a wooden frame.



G E Fever Cabinet

A single loop of electromagnetic induction cable is permanently affixed to the framework, which supports the latex mattress. The induction cable leads to two plugs, which in turn fit into the jacks at the back of the Inductotherm. The latex mattress fits over the cable and is covered with a terry cloth blanket to absorb perspiration. The mattress is made of curled hair impregnated with latex. When the patient lies in the cabinet, he has wide visibility over the room because of the sloping head of the cabinet.

The firm submitted data indicating the length of time required to induce fever in fifteen treatments on eight different patients. The rate of temperature rise ranges from 2.5 to 4.15 degrees F per hour, with an average value of 3.14 degrees F per hour. Twelve fever charts were also submitted, showing temperature and respiration curves made from data gathered every fifteen minutes during the treatments.

Before placing the patient in the cabinet, according to the directions of the firm, the unit should be preheated to 110 F by the resistance heater. During the preheating, the terry cloths on which the patient lies are placed in the cabinet. It is necessary to close the head opening with a pillow during preheating. The patient is next placed in the cabinet and the Inductotherm turned on. During the induction period the cabinet temperature is maintained at 110 F. When the patient's rectal temperature is within 1 to 1.5 degrees F of the temperature level desired, the Inductotherm and fan heater are turned off. This is for the purpose of allowing for an extra increase in temperature after heat application is discontinued. If the temperature does not rise to the desired level, the Inductotherm is again turned on. During the induction period the rectal temperature, pulse and respiration of the patient are taken every fifteen minutes. When the desired temperature is reached, it is maintained by keeping the temperature in the cabinet at approximately 95 F for rectal temperatures of 104 F and at about 100 F for rectal temperatures of 106.5 F. According to the firm the high humidity of the cabinet makes this possible. If an electric thermometer is used in taking rectal temperatures the Inductotherm must be turned off when obser-

vations are taken because the high frequency current interferes and causes erroneous readings.

The fever cabinet was tested clinically by an investigator acceptable to the Council. Eighteen charts were submitted by this consultant, recording temperature and pulse curves made from data gathered at fifteen minute intervals. These curves appear to be satisfactory.

In view of the foregoing report, the Council on Physical Therapy voted to include the General Electric Fever Cabinet in its list of accepted devices.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

#### BRUCELLA MELITENSIS VACCINE (See New and Nonofficial Remedies, 1937, p 408)

Abbott Laboratories, North Chicago, Ill

*Brucella Melitensis Bacterin Abbott*—A heat killed suspension of *Brucella melitensis* (var abortus) organisms (2 000 million per cubic centimeter) prepared by using the bovine strain only and preserved with 0.5 per cent of phenol. The usual sterility tests prescribed by the National Institute of Health are made. The purity of the cultures is determined before the vaccine is made by complete cultural characteristics and by agglutination tests with specific serum. Safety tests on the stock vaccine are made by injecting two white mice with 0.5 cc each subcutaneously, two guinea pigs with 1 cc each intraperitoneally and one guinea pig with 5 cc intraperitoneally; the animals being observed for ten days. No potency tests are made. The product is marketed in packages of one 6 cc vial and in packages of one 20 cc vial.

*Dosage*—The subcutaneous injection of 0.25 cc increased gradually to 1 cc in five or six injections at three day intervals is suggested.

#### NEO-SYNEPHRIN HYDROCHLORIDE (See New and Nonofficial Remedies, 1937, p 224)

The following dosage form has been accepted

*Solution Neo Synephrin Hydrochloride 1 per Cent (for parenteral use)*—A sterile solution of neo synephrin hydrochloride 1 per cent and sodium chloride 0.8 per cent in distilled water.

#### PONTOCAINE HYDROCHLORIDE (See THE JOURNAL, Aug 7, 1937, p 433, also the Revised Supplement to New and Nonofficial Remedies, 1937, p 7)

The following dosage form has been accepted

*Pontocaine Hydrochloride Tablets 0.1 Gm*—Each tablet contains pontocaine hydrochloride 0.1 Gm, boric acid 0.005 Gm, acetone sodium bisulfite not more than 0.0002 Gm. To be used only for preparing solutions for surface anesthesia (not for injection) in rhinology, otology, ophthalmology and dentistry.

#### DEXTROSE (See New and Nonofficial Remedies, 1937, p 155)

The Abbott Laboratories, North Chicago, Ill

*Dextrose 2 1/2% in Physiological Sodium Chloride Solution*—Each 100 cc contains dextrose U S P 2.5 Gm and sodium chloride 0.8 Gm; marketed in bottles containing 500 and 1 000 cc.

*Dextrose 20% W/V in Distilled Water*—Each 100 cc contains dextrose U S P 20 Gm. Marketed in bottles containing 500 and 1 000 cc.

*Dextrose U S P 25% W/V in Physiological Sodium Chloride Solution*—Each 100 cc contains dextrose U S P 25 Gm and sodium chloride 0.8 Gm. Marketed in bottles containing 500 and 1 000 cc.

#### SULFANILAMIDE (See THE JOURNAL July 31, 1937, page 358, Oct 30, 1937, page 1454 and Revised Supplement to New and Nonofficial Remedies, 1937, page 27)

*Sulfanilamide-Mallinckrodt*—A brand of sulfanilamide—N N R

Manufactured by Mallinckrodt Chemical Company, St. Louis. No U S patent or trademark.

#### MEAD'S OLEUM PERCOMORPHUM (see New and Nonofficial Remedies, 1937, p 472)

The following dosage form has been accepted

*Mead's Compound Syrup Oleum Percomorphum*—An emulsion of oleum percomorphum 0.65 per cent, olive oil 23.2 per cent, malt syrup 65.33 per cent with water 8.1 per cent, alcohol 2.1 per cent, pectin 0.4 per cent and gum tragacanth 0.2 per cent (percentages by weight). The mixture is standardized by biologic assay to have a potency of not less than 780 U S P vitamin A and 110 U S P vitamin D units per gram (respectively 28 000 and 3 900 units per fluidounce).

<sup>1</sup> Inductotherm Acceptable J A M 104 1706 (May 11) 1933  
Inductotherm (One Tube) Acceptable ibid 106 1091 (March 28) 1936

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 19, 1938

## CALIFORNIA'S "HUMANE POUND LAW" AND MEDICAL RESEARCH

Unscientific movements are constantly promoted, based on misinformation, prejudice, emotionalism and cynical racketeering. Chiropractors, naturopaths, naprapaths, herbologists and all sorts of -paths, -ologies and -isms ally themselves with other quacks and sentimentalists to oppose medical research, which exposes the hollowness of their pretensions. The antivivisectionists have made hay in the California sunshine. Fortified with some prominent theatrical names and disregarding the absence of scientific qualifications in such sponsorship, the antivivisectionists have frequently attempted to throttle research in California and in other states.

In 1932 and subsequently, a determined attempt was made to interfere with the use of dogs from the San Francisco pound, by the medical schools in the San Francisco Bay area.<sup>1</sup> This attempt was frustrated by the combined vigilance of the medical profession and public health authorities. Undeterred by this failure, the "antis" in 1937 turned to the initiative provided under California law and circulated a petition for a so-called Humane Pound Law. The crucial provision in this law is that dogs and cats shall not be delivered to medical schools from public pounds. This means that research involving dogs would be prohibitive in price, since the breeding of dogs for research purposes is not practical. The petition received the requisite number of signatures and will appear on the ballot at the election of Nov. 8, 1938. Many of the signers of the petition obviously did not understand what they asked for with their signatures. As was pointed out in our discussion of the Colorado proposal last week, many signers fail to understand the ultimate effects of the petitions to which they affix their signatures. Many estimable persons imbued with the spirit of kindness to animals may feel inclined to vote for this pernicious legislation unless they are fully informed in time as

to what it would mean in the harassment of medical education, the hampering of medical research, and interference with the manufacturing and testing of drugs and biologic products.

A California Society for the Promotion of Medical Research is the answer of the enlightened people of California to the challenge of the antivivisectionists and their cultist, faker, faddist and fraud-monger allies. Among California's leading citizens who will be active in the society, or will lend it their moral support and influence, are Ray Lyman Wilbur, president of Stanford University, Robert Gordon Sproul, president of the University of California, the Rt. Reverend Charles A. Ramm, Monsignor St. Mary's Cathedral, San Francisco, Rabbi Irving F. Reichert, Temple Emanu El, San Francisco, and Rev. William Kirk Guthrie, D.D., San Francisco. Organization and membership work is proceeding actively.

The forces seeking the adoption of the so-called Humane Pound Law appear to be well financed and give every evidence of determination to achieve their purpose. They have heretofore demonstrated their total immunity to any appeals to reason. Dominated as they are by their mistaken ideas of humanitarianism, by which if successful they would precipitate on the people of California a deluge of disease, pain and death, they cannot be persuaded. They must be defeated. This issue is not confined to California. Just as this law is not primarily a humane pound law but an entering wedge for intolerable restrictions on the freedom of scientific research, so its adoption in California will be the signal for renewed campaigns in other states. If any one doubts this, the following quotation from an antivivisectionist publication should be convincing: "there is but one honorable stand to take, and that is to talk, write and work for the COMPLETE ABOLITION OF VIVISECTION"<sup>2</sup> (capitals in original). The medical profession of California and its enlightened allies, the dental and veterinary professions and many of California's leading citizens, have the welfare of their state and its people as much at heart as any crack-brained coterie of false humanitarians can claim to have. They are backed by considered opinions based on scientifically demonstrated facts which underlie the modern record of health improvement through the application of the fruits of research.

The medical profession has always stood for the public health against those fanatical groups who, offering nothing constructive, would tear down the whole structure of scientific research. It is time the public helped in its own defense. The California Society for the Promotion of Medical Research is a step in the right direction. It should become a permanent

<sup>1</sup> Question Is of Fut. San Francisco Chronicle, July 11, 1932.

<sup>2</sup> The Animal Helper, Vol. 7, January 1938, published by 1  
Whitaker, Dayton, Ohio.



organization, national in scope, adequately supported with money, similar to the British Research Defense Council. The American Medical Association has long had a Committee for Protection of Medical Research. With the cooperation of the Bureau of Health and Public Instruction, this committee has helped to keep the antivivisectionists partially in check by cooperating locally with medical schools and medical societies. Numerous efforts directed at crippling research have been defeated. All this is not enough. Promotion is needed as well as defense. A national society of enlightened persons in all professions, in business, in industry and in public life is needed to preserve the country from the evil influence of this distorted antivivisectionist propaganda.

### THE DEVELOPMENT OF GRADUATE MEDICAL EDUCATION

Surveys of graduate medical schools were made in 1915 by Dr. Horace D. Arnold and the secretary of the Council on Medical Education and Hospitals and in 1919 by Dr. Arthur D. Bevan, chairman of the Council, and Dr. Louis B. Wilson, and in certain instances with Dr. William Pepper, Dr. James Ewing or other members of the Council's special committee on graduate medical education. In 1922-1923 inspection of all graduate medical schools in the United States was made by the secretary of the Council and Dr. Wilson. The Council noted a decided improvement in training offered in 1923 in contrast to instruction given in 1919. At that time extension courses of lectures and clinics were being given under the auspices of the universities of North Carolina, Pennsylvania, Wisconsin and Washington and by other state universities. Seven medical schools, three graduate schools and an infirmary were found to be giving satisfactory courses for practicing physicians or complete courses in one or more of the specialties. Four other graduate schools were being inaugurated. The Council in 1923 expressed its willingness to cooperate with any county, state or district medical society in organizing graduate courses or clinics.

Increasing opportunities are now being afforded by county, state and district medical societies in conducting graduate programs and diagnostic clinics. As early as 1916 North Carolina gave extension courses throughout the state. Wisconsin began a similar program in 1917 and Georgia in 1918. In 1922 the Medical Society of the County of Kings, New York, and the Long Island Hospital cooperated in giving extension courses for physicians. In 1925 the New York State Medical Society offered extension courses to any county medical society requesting instruction. By 1934 twenty-two states had organized plans for postgraduate study.<sup>1</sup>

Michigan since 1893 has offered through its two medical schools opportunities for physicians to keep

informed. Soon after the World War the Michigan State Medical Society inaugurated postgraduate conferences. After several years it became apparent, however, "that there was a growing demand for a type of instruction that included greater continuity and more academic direction. The next step in the society's progress in the educational field did not come through failure of the postgraduate conference plan but was instituted when this program was operating at its greatest efficiency."<sup>2</sup> Michigan's present plan was summarized recently<sup>3</sup> in *THE JOURNAL*.

In January 1937 the Bureau of Economics at the suggestion of Dr. Roscoe L. Sensenich questioned each state medical society regarding its activities in graduate medical education for practicing physicians. Thirty-four state societies replied that they were offering some form of systematic graduate instruction. Colleges, state health departments, social security administrators and various foundations were cooperating in several states. Nearly every state association reported that some form of graduate education was being offered at a central location, and efforts were being made in about three fourths of the states to carry instruction to all sections of each state. The majority of courses were given for general practitioners. They were financed from the treasuries of state medical societies, by registration fees or by financial assistance from other sources such as funds allotted under the Social Security Act.

The President-Elect, Dr. J. H. J. Upham,<sup>4</sup> declared at the last annual meeting of the American Medical Association that "two lines of organization activities might engage the attention of this body: first, the subject of the continued education of our members after graduation, and, second, the better informing of the public with regard to modern scientific medicine and health matters in general." He felt that the Council on Medical Education and Hospitals might study the possibilities of traveling postgraduate courses as already organized in some states through the cooperation of state medical associations and medical colleges with the hope of bringing modern medical developments to practitioners living in the more isolated areas of the country. The Council on Medical Education and Hospitals has acted on these recommendations, and since October 1937 a member of the staff of the Council has visited ten states and has reviewed the programs of graduate medical instruction in each. Progress reports on this field study are being published in the Organization Section. By referring to these summaries, critics may find an answer to the charge that the medical profession is not concerned with self improvement.

<sup>2</sup> Bruce, J. D. Postgraduate Education in Medicine. *J. Michigan M. Soc.* 26: 569 (June) 1937.

<sup>3</sup> Graduate Medical Education. III. *Michigan J. A. M. A.* 110: 73B (Feb. 5) 1938.

<sup>4</sup> Upham, J. H. J. Address of President-Elect. *J. A. M. A.* 108: 2132 (June 19) 1937. *Proceedings of the House of Delegates of the A. M. A. Eighty-Eighth Annual Session, Atlantic City, N. J., June 7-11, 1937*, p. 2132.

<sup>1</sup> Parkins, L. E. Extension Postgraduate Medical Instruction in the United States and Canada. *J. A. M. A.* 102: 2155 (June 30) 1934.

NEW SERIES OF ARTICLES ON  
THE VITAMINS

In 1932 THE JOURNAL published a series of articles on the vitamins, prepared by a number of experts under the general auspices of the Council on Pharmacy and Chemistry and the Committee on Foods. Since that time vitamin C has been isolated, its chemical structure has been established and the product has been synthesized. The importance of riboflavin in nutrition was largely unknown a few years ago, and today a synthetic product is being made available by pharmaceutical firms. Announcement of the synthesis of vitamin B<sub>1</sub> was made in the summer of 1936. Several years ago vitamin D was thought by the majority of investigators to be a single substance. Now it is known that there are several substances which exert a vitamin D effect.

This newer knowledge of the vitamins seems to have created more problems than had been settled. For example, there are more substances having vitamin properties than there are letters in the alphabet. This has emphasized the difficulties of nomenclature and the desirability of introducing, as rapidly as information warrants, chemical names for the substances heretofore designated only by letter. The isolation of the vitamins in pure form not only makes imperative the reinvestigation of some of the important contributions of the past, which were made with crude or impure vitamin preparations, but also opens great possibilities in therapeutics.

To aid students of the vitamins, the Council on Foods and the Council on Pharmacy and Chemistry have jointly sponsored the preparation of a new series of articles on this subject. More than thirty articles have been prepared by recognized authorities, the first appearing in this issue, page 577. They will be published in THE JOURNAL and later collected in book form.

## Current Comment

## RETRANSFUSION SHOCK

Earlier immunologists who had occasion to make numerous blood transfusions in dogs found that toxic reactions never take place on primary transfusion in this animal species regardless of the age, sex, size or breed of recipient or donor. Not until physiologists had occasion to perform repeated blood transfusions from the same donor was an occasional retransfusion shock noted. These retransfusion incompatibilities have been studied in considerable detail by Melnick and Cowgill<sup>1</sup> of Yale University. In their hands the occasional toxic reaction on retransfusion exhibits all the characteristic features of acute anaphylactic shock in this animal species. They found that an incubation period of about one week is necessary between the first and second transfusions in order to produce retransfusion shock and that the acquired incompatibility

usually lasts from five to ten weeks. The Yale biochemists found that during the sensitive period the serum of the recipient will both hemolyze and agglutinate donor erythrocytes. Donor serum, however, is without demonstrable test tube effects on recipient red blood corpuscles. By means of such allergic hemagglutinins, Melnick and Cowgill found that dogs can be divided into two blood groups: group A, which is non-reactive to allergic serum, and group B, reactive to this serum. They found that A recipients will develop retransfusion sensitivity toward B donors but that B recipients cannot be sensitized to A corpuscles. To explain this observation the Yale biochemists assume that A and B corpuscles are identical in antigenic structure, except for a B characteristic not present in A corpuscles.

## TRICHINOSIS

The presence of *Trichinella spiralis* in the human body without diagnosis is now recognized as much more common than formerly believed. Thus M. C. Hall<sup>2</sup> stated that the examination of 1,778 cadavers at twenty-four hospitals in eleven places in the United States indicated an incidence of at least 12.5 per cent with trichinae. This observation is in the face of a diagnosis of trichinosis in not more than one case out of 222 positive cases at any time. Similarly Scheffey<sup>3</sup> found 12.7 per cent of 118 cadavers from Minneapolis and St. Paul Charity hospitals to be trichinous. A. A. Hall<sup>3</sup> has reported an outbreak of trichinosis in central Ohio in which there were six cases apparently resulting from the eating of one 300 pound hog. All these cases were positive to the Bachman intradermal skin test. This test is one of a number of means of making a positive diagnosis. It may also be determined by the detection of larvae or adult worms in the intestine and of larvae in the lymph, blood or other tissues. Spink<sup>4</sup> also has corroborated the value of the trichinella antigen as a diagnostic skin test and emphasizes the usefulness of the blood precipitin test. Certainly the infestation is widespread and not by any means restricted to this country. Over a century ago its presence in Germany was recorded frequently. Cameron<sup>5</sup> in a brief review of the subject points out that, while any skeletal muscle may be affected, muscles that are especially active and so have a large blood supply are most heavily involved. The symptoms may be divided into three clinical steps: ingress, corresponding to the development of the worm to maturity in the intestine, accompanied by nausea, diarrhea and abdominal pain; digression, corresponding to the dissemination of the larvae throughout the body accompanied by muscular pains, edema (especially of the eyes and face) and symptoms associated with the invasion of particular muscles, fever and eosinophilia.

- 1 Melnick, Daniel and Cowgill, G. R. *Proc Soc Exper Biol & Med.* 36: 697 (June) 1937
- 2 Hall, M. C. *Studies on Trichinosis* Pub. Health Rep. 52: 539 (April 30) 1937
- 3 Scheffey, C. H. *The Prevalence of Trichinosis* *Am J Hyg.* 27: 142 (Jan.) 1938
- 3 Hall, A. A. *An Outbreak of Trichinosis in Central Ohio and the Use of the Bachman Intradermal Skin Test* *Ann Int Med.* 10: 1544 (April) 1937
- 4 Spink, W. W. *Trichinella Antigen: Further Observations on Its Use in the Diagnosis of Trichinosis* *New England J Med.* 210: 3 (Jan. 7) 1937
- 5 Cameron, T. W. M. *Trichinosis* *Canad J Comp Med.* 1: 3 (Nov.) 1937

and regression, or convalescence. The symptoms, however, often involve some difficulty in diagnosis—Cameron lists some forty disorders which have been confused with trichinosis. Prevention in man, Cameron says, is at present largely a matter of education. It is not practical to inspect pork at the packing plant so as to exclude every case, but the public should be informed that the parasite is not more common than formerly, that thorough cooking renders pork safe and that when obtained from a private source the danger from undercooking is particularly great.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ARKANSAS

**District Meeting**—The Fifth Councilor District Medical Society was addressed January 11 in El Dorado by Drs. Kingsley W. Cosgrove, Little Rock, on "Blindness"; Augustus C. Shupp, Little Rock, "Early Recognition and Management of Tuberculosis in Childhood"; Albert S. Buchanan, Prescott, problems of the small town surgeon, and Joseph B. Wharton Jr., El Dorado, "Treatment of Peptic Ulcers."

### CALIFORNIA

**Conviction of Former State Board Inspector**—The California Supreme Court, Nov. 26, 1937, affirmed the decision of the Los Angeles Superior Court in finding William A. Byrne, former inspector for the state board of medical examiners, guilty on five counts of being involved in an abortion syndicate in California, Washington and Oregon. Byrne had been placed in jail when he with another member of the syndicate, R. L. Rankin, had attempted to intimidate witnesses. Byrne now stands to serve a sentence of from ten to twenty-five years, it is reported. The same court ordered a new trial for Drs. James Beggs, Jesse C. Ross and Valentine St. John, all of whom were involved in the syndicate and who were sentenced to serve from ten to twenty-five years in jail. Testimony in the trials disclosed that Dr. George Watts and R. L. Rankin owned, operated and directed a series of offices extending from Seattle to San Diego, for the purpose of performing illegal operations. The remaining defendants, with the exception of those who were acquitted by the jury, were employed by Rankin and Watts in various capacities in their illegal business. Each appellant urged reversal of the judgment on the ground that there was no substantial corroboration of the testimony of his accomplices to show his participation in or connection with any of the crimes of which he was convicted. The supreme court found this true in the cases of Beggs, Ross and St. John, but not in the case of Byrnes. Rankin's appeal was dismissed at his own request. Thirty-one persons were indicted in the racket. So well organized was the ring, said to net \$1,000,000 annually, that the physicians were rotated in the various cities at frequent intervals to avoid becoming well known. The "Medical Acceptance Corporation" was an outgrowth of the syndicate's operations, it was said, patterned after the financing of automobile agencies to arrange for payments, with rates of interest appropriate under the circumstances, from some of the patients.

### CONNECTICUT

**Changes in Health Officers**—Dr. Ernest R. Pendleton has been appointed health officer of the town of Granby, Dr. Eugene N. Cozzolino, health officer of West Haven, succeeding the late Dr. Charles E. Kaufman, and Dr. Howard R. Hansell, health officer of Sharon, during the absence of Dr. Jerome S. Chaffee.

**Laboratory Work Increases**—The laboratories of the state department of health reported 240,273 examinations during 1937 as compared with 234,515 in 1936, an increase of 2.5 per cent. An analysis of the figures shows that 136,557 examinations, 56.8 per cent of the total, were made during the first

six months of the year. According to the *Connecticut Health News*, the decrease in examinations of 32,841, or 24.1 per cent, experienced during the latter half of the year occurred after a laboratory retrenchment program became effective July 1.

**Pneumonia Service Augmented**—Federal funds are being used by the Connecticut State Department of Health to finance a program to assist physicians throughout the state in pneumonia control. Type specific antipneumococcus serum for six types of pneumococcus instead of two as heretofore is now available, and a complete laboratory service free to all physicians in the state was inaugurated February 1 on a twenty-four hour basis. The service includes typing for all known types of pneumococcus, agglutination tests and blood cultures.

**Memorial to Dr. Root**—Mrs. Era C. Root, widow of the late Dr. Edward King Root, medical director Aetna Life Insurance Company, has given \$200,000 to the Hartford Hospital, Hartford, to perpetuate the name of her husband and to help the hospital realize a fund of \$2,500,000 for new construction, according to the *Hartford Courier*. One half of the gift will be held by the hospital as the "Edward King Root Maintenance Fund," the income to be used for "current purposes" of the institution, and the other half will be added to the building fund. Plans announced for the new Hartford Hospital call for a building to cost more than \$2,500,000, including equipment and a power house costing \$400,000. A study of the hospital's facilities showed that 42 per cent of the buildings on the grounds have been in continuous operation for from fifty to seventy-seven years and that since 1921 the number of patients has doubled.

### DISTRICT OF COLUMBIA

**Violation of Law Concerning Prevention of Tuberculosis**—Solomon Bell, aged 73, recently pleaded guilty in police court to a violation of the District law relating to the prevention of tuberculosis and was given a choice by the police court of paying a fine or receiving treatment in a sanatorium. Bell had previously refused treatment for moderately advanced pulmonary tuberculosis, his sputum was positive. In July 1936 a private physician reported that Mr. Bell had tuberculosis. He did not keep an appointment at a chest clinic later in the month. Subsequently he was antagonistic whenever nurses of the health department called, refused to have his children examined and would not accept hospitalization. According to Dr. George C. Ruhland, health commissioner, this was a test case of the right of the District health department to prevent a man from spreading the disease.

### ILLINOIS

**State Society Organizes Fifty Year Club**—At a meeting in Springfield, January 3, the council of the Illinois State Medical Society voted to organize the "Fifty Year Club" for any member of the society "who graduated fifty years ago and those physicians, not active society members, who have practiced fifty years and are recommended by their local county medical society." A special file of these men will be maintained by the society and gold emblems will be issued. Since the council took this action, about fifty-six medals have been presented in twenty-nine counties and plans are under way in other counties to make the presentation.

### Chicago

**Public Lecture on Blood Pressure**—Dr. Newell C. Gilbert, professor of medicine, Northwestern University Medical School, will deliver a public lecture in the Goodman Theater, February 20, under the auspices of the Chicago Medical Society. His subject will be "You and Your Blood Pressure."

**The Hedblom Lecture**—Phi Beta Pi Medical Fraternity is sponsoring a series of lectures which has been dedicated to the memory of Dr. Carl A. Hedblom, professor and head of the department of surgery, University of Illinois College of Medicine. The first of these annual lectures was delivered February 16 at the college of medicine by Dr. Evarts A. Graham, Babby professor of surgery, Washington University School of Medicine, St. Louis who discussed "Some Accomplishments in Chest Surgery." Dr. Hedblom died in 1934.

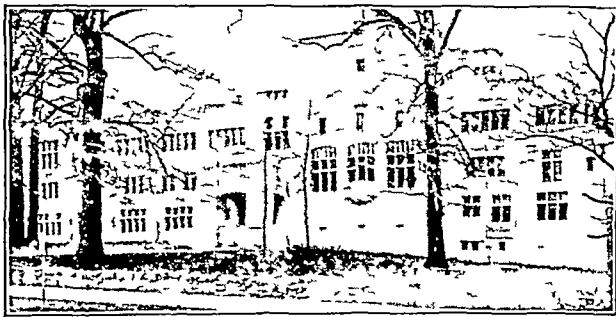
**Society News**—Drs. Cecil S. O'Brien and James H. Allen, Iowa City, discussed "Staphylococcus Conjunctivitis" before the Chicago Ophthalmological Society at its recent annual meeting. Dr. Georgiana M. D. Theobald, Oak Park, Ill., was chosen president.—The Chicago Society of Internal Medicine will be addressed February 28 by Drs. Samuel C. Robinson on "What is Normal Blood Pressure? An Analysis of 10,000 Cases", Dr. Allan T. Kenyon, Irene Vanderford, Ph.D., Dr. Albert Hughes Bryan, Miss Kathryn Knowlton and Fred C.

Koch, Ph D, and Dr Wilhelm Dressler, Vienna, Austria, "Cardiology"—The Chicago Pediatric Society was addressed January 18 by George E Axtelle, School of Education, Northwestern University, "The Organic Theory of Mind and Its Bearing on Education", Carleton Washburne, superintendent of Winnetka public schools, "The Living Philosophy of Education," and Dr George D G Campbell, assistant clinical professor of psychiatry, Rush Medical College, and psychiatrist to the health service, University of Chicago, "Neurolinguistic Factors in Child Development"

### INDIANA

**Personal**—Dr Joseph F Michaels, Loogootee, has been appointed health officer of Marion County—Dr Ernest V Nolt, Columbia City, has been appointed health officer of Whitley County—Arthur V Brown, for seventeen years a member and now president of the board of trustees of Methodist Hospital, Indianapolis, was honored at a dinner given by more than 700 friends and associates at the Claypool Hotel, January 26. Speakers included Drs William N Wishard Jr as toastmaster, John H J Upham, Columbus, Ohio, President of the American Medical Association, and Edmund D Clark, a member of the hospital's medical advisory board, who presented to Mr Brown a scroll expressing appreciation of his services

**New Medical Building at Bloomington**—A new medical unit was dedicated at the University of Indiana School of Medicine at Bloomington recently. The speakers included Gov M Clifford Townsend, who presided, U S Senator Sherman Minton, Indianapolis, who gave the dedicatory address, and



State university's new medical unit.

Dr Fred C Zapffe, Chicago, secretary of the Association of American Medical Colleges. The new building houses the departments of anatomy, hygiene and physiology and replaces medical classrooms formerly in Owen Hall, one of the original buildings on the present university campus. It also contains the combined libraries of the three departments. Instruction in the freshman year of medical training will be given in the new building and advanced work will be done in Indianapolis. The cost of the building was about \$485,000 and was financed by federal funds

### IOWA

**Personal**—Dr Daniel C Barrett, formerly with the health department in Cincinnati, has been appointed health officer of Washington County with headquarters in Washington, succeeding Dr Eugene L Walsh, who has resigned to join the staff of Hines Hospital, Maywood, Ill.—Dr Charles E Irwin, chief surgeon, Iowa Soldiers' Home Hospital, Marshalltown, has been appointed superintendent of the state hospital at Woodward. It is reported

### KANSAS

**Liaison Between Medical and Pharmaceutical Societies**—At a joint meeting of the Kansas State Board of Medical Registration and Examination and the state board of pharmacy, Nov 13, 1937 it was agreed that each board recommend to its respective state society the appointment of a special committee of three members to work together in an effort to have a mutual understanding and help solve the problems concerning the two groups. The state medical board December 14 adopted a resolution asking the Kansas Medical Society to appoint such a committee

**State Activities Discussed**—Meetings of the First and Second councilor district medical societies in Horton and Lawrence respectively, January 16 marked the opening of a series of lectures sponsored by the committee on public policy of the Kansas Medical Society to acquaint members of the state society with activities of the organization. Speakers at the

initial meetings of the series included Drs Louis L Bresette, Kansas City, Rolland W Urte, Parsons, Edgar C Duncan, Fredonia, Forrest L Loveland, William M Mills and Mr Clarence G Munns, Topeka, executive secretary of the society. The subjects included legislative activities of the society, socialization of medicine, care of the indigent and semi-indigent, information relating to cultists and quacks, and present and future projects of the society. Similar meetings are planned for all districts and the series will conclude with a session of the twelfth district in Dodge City, February 28

### LOUISIANA

**Personal**—Dr Isadore Brickman has been appointed superintendent of the State Colony and Training School at Alexandria

**Society News**—A symposium on virus diseases was presented before the Orleans Parish Medical Society January 24 by Kenneth L Burdon, Ph D, and Drs Joseph Rigney D'Aunoy, Roy H Turner and Herbert J Schattenberg—Dr Erwin E Nelson, head of the department of pharmacology, Tulane University of Louisiana School of Medicine, New Orleans, addressed the New Orleans Academy of Science recently on "Work of the Food and Drug Administration"—Dr Grandison D Royston, St Louis, discussed "Puerperal Complications" before the New Orleans Gynecological and Obstetrical Society January 21, other speakers were Drs Earl C Smith and Lucien A Ledoux, both of New Orleans, on "Elliot Treatment of Pelvic Inflammatory Diseases of Women as Used in Office or Private Practice" and "Ruptured Hemorrhagic Ovarian Follicle Complicating Acute Appendicitis" respectively

### MASSACHUSETTS

**Conference on Mental Health in Education**—The Massachusetts Society for Mental Hygiene will conduct a conference on mental health in education in cooperation with twenty-five educational institutions in the state, both public and private, at the Hotel Statler, Boston, March 11-12. A luncheon meeting on "Human Values in Education" will conclude the session Saturday

**Publicity Campaign for Pneumonia Control**—The state department of health has undertaken a special program of publicity in its campaign to control pneumonia to educate the public to the value of specific serums. In addition to making available the serums for the various types of the disease, the department will sponsor the showing of a motion picture entitled "A New Day" at a number of motion picture theaters throughout the state. The film was made under the auspices of the U S Public Health Service and made available to the health department by the Metropolitan Life Insurance Company. Publicity will be given over the radio and in the press, and arrangements are being made to provide speakers on the subject to organizations requesting them. Massachusetts recently concluded a five year study of the disease

**Health Education at Institute of Technology**—A new course in public health education was begun at the Massachusetts Institute of Technology, Boston, at the opening of the second semester recently, according to the New York Times with Clair E Turner, Dr PH, professor of biology and public health in charge. The course will train professional workers in technique, scope and methods of educating the public. Emphasis will be placed on the practical experience of planning health education campaigns. In some instances it is hoped to put into practice community programs planned by the students, who will cooperate with local health agencies. Mediums used in health education campaigns, the press, motion and still pictures, radio public lectures, exhibits, reports, personal contacts and methods of operating in conjunction with schools will be studied to determine their value, field of usefulness, cost advantages and disadvantages and the techniques required for each medium. According to present plans, twenty students will be admitted to the course

### MICHIGAN

**Society News**—William J Burns, executive secretary, Michigan State Medical Society, addressed the Washtenaw County Medical Society meeting jointly with the Ann Arbor and Washtenaw county bar associations February 8 in Ann Arbor on New Prenuptial and Compensation Laws—Dr Isidor C Rubin, New York, addressed the Wayne County Medical Society, Detroit February 7, on "Tubal Insufflation: Its Diagnostic and Therapeutic Use in Sterility". Dr George W Kosmak, New York, will address a joint meeting of the society with the Detroit Obstetrical and Gynecological Society,

February 28, on "The Responsibility of the Medical Profession in the Movement for Birth Control"—Dr Max Minor Peet, Ann Arbor, discussed "The Surgical Treatment of Hypertension" before the Oakland County Medical Society, Pontiac, February 2

**State Health Department Activities**—The title of the bureau of child hygiene and public health nursing of the state department of health has been changed to the bureau of maternal and child health, it will continue under the direction of Dr Lillian R Smith with Dr Goldie B Corneliussen, Lansing, as associate director. The bureau has organized an obstetric nursing service in Cass County, similar to that being conducted in twenty-six demonstration areas throughout the United States. The new service makes it possible for nurses to accompany physicians on request at deliveries and provide necessary bedside care. Working closely with the medical profession, the nurses will attempt to reach every expectant mother and promote adequate antepartum medical care. The service will not be of an emergency type, it was stated. Dr Roelof Lanting has been appointed director of the Delta County Health Department, succeeding Dr Robert C Farrier, Escanaba.

## MINNESOTA

**Annual County Officers' Meeting**—The Minnesota State Medical Association will hold its annual county officers' meeting at the Hotel St Paul, St Paul, February 26. Speakers will include

Dr Joel C Hultkrans, Minneapolis. Constitutions for Component Societies.  
Dr Monte C Piper, Rochester. Biographies of Members.  
Dr George A Earl, St. Paul. Interprofessional Meetings.  
Dr Russell J Moe, Duluth. State Meeting.  
Mr T V McDavitt, Bureau of Legal Medicine and Legislation. American Medical Association. Chicago. Some Recent Trends in Medical Legislation.  
William S Ervin, attorney general of Minnesota. St. Paul. The Duties and Responsibilities of the Attorney General.  
C R Carlgren, St. Paul. chairman state board of control Social Welfare in Minnesota.  
Dr Julian F DuBois, secretary state board of medical examiners. Sauk Center. The Public's Basic Science Law.  
Dr William A O'Brien, Minneapolis. Center for Continuation Study.  
Dr Everett C Hartley, St. Paul. Refresher Courses.

A symposium on health activities will be presented by Drs Albert J Chesley, Robert M Burns and Herman E. Hilleboe, all of St. Paul, and Mrs Harlow Hanson, Minneapolis.

## MISSISSIPPI

**Dr W A Evans Presents Books to State Board**—The Medical and Public Health Library of the Mississippi State Board of Health has received about 1,200 volumes from Dr William A Evans, Aberdeen, formerly of Chicago. Dr Evans was president of the American Public Health Association in 1916 and of the Chicago Medical Society in 1902. For many years he was health columnist of the Chicago Tribune.

## MISSOURI

**Society News**—The program of the St. Louis Medical Society, February 1, was presented by the Missouri Social Hygiene Association, the speakers were Drs Llewellyn Sale on "Youth Demands Adequate Knowledge", Richard S Weiss, "Facts, Figures and Fallacies Youth Should Know", and Truman Douglass, D.D., "Youth in Training for Marriage". The Trudeau Club was addressed in St. Louis February 3, among others, by Drs Daniel W Myers and Alfred Goldman on "Pulmonary Bronchography" and "Pulmonary Moniliasis" respectively. At a meeting of the Jackson County Medical Society in Kansas City February 1 Drs Clarence S Capell discussed "The Significance of Blood in the Urine" and Paul F Stookey and Louis A Scarpellino, "Staphylococcus Septicemia".

**State Joins Fight Against Venereal Diseases**—With the distribution of free drugs in the treatment of venereal diseases and provision for the treatment of indigent persons, the state department of health has actively launched its program in the national campaign against these diseases. Treatment centers have been established in district 1, Scott and Mississippi counties, district 2, Stoddard and New Madrid counties, district 3, Dunklin and Pemiscot counties, district 4, Wayne, Ripley, Carter and Butler counties, and district 7, Bates, Henry, Benton, Morgan, Vernon, St. Clair, Hickory, Camden, Cedar, Polk, Dallas and Laclede counties. It is planned to establish thirty-three additional centers as rapidly as possible. Newspapers reported. Each of the large cities in the state now maintains syphilis control clinics, and the health departments in Miller, St. Louis, Marion and Jackson counties also are operating programs.

## NEW YORK

**Society News**—Dr Charles H Goodrich, Brooklyn, president of the Medical Society of the State of New York, addressed the Broome County Medical Society, Binghamton, February 8 on "The Future of Medicine". A symposium on diseases of the blood-forming organs was presented before the Onondaga County Medical Society, Syracuse, February 1 by Drs Ellery G Allen, A Carl Hofmann, John Van Duyen II and Sidney A Britten.

## New York City

**The Sir Robert Jones Lecture**—The Hospital for Joint Diseases announces that Dr Frederick C Kidner, Detroit, will deliver the eighth Sir Robert Jones Lecture at the Hospital, February 24, on "Congenital Dislocation of the Hip".

**Medicomilitary Symposium**—The Medical Section of the Organized Reserves, Second Corps Area, announces a symposium on medicomilitary preparedness to be held at the Army Building, 39 Whitehall Street, March 29-31. There will also be an exhibit at the Seventy-First Regiment Armory and a dinner at the Town Hall Club, at which Dr Charles R Reynolds, surgeon general, U S Army, Washington, D C, and Col Jay W Grissinger, second corps area surgeon, will be the guests of honor.

**Fifty Years of Laboratory Research**—The fiftieth anniversary of the founding of the Hoagland Laboratory of the Long Island College Hospital was observed December 17 with a special meeting at the laboratory and a dinner. Dr Oswald T Avery of the Rockefeller Institute for Medical Research, a former member of the Hoagland staff, spoke on "The State of Bacteriology Fifty Years Ago and Today". Dr Avery and two other former members of the staff, Benjamin White, Ph.D., formerly assistant professor of bacteriology and immunology, Harvard University Medical School, Boston, and Harold Lyall, Ph.D., assistant director, division of laboratories, state department of health, Albany, were guests of honor at the dinner. Dr Joshua M Van Cott, president of the board of trustees of the laboratory, was toastmaster and brief addresses were made by Dr Frank L Babbott, president of the Long Island College of Medicine, Dr Wade W Oliver, professor of bacteriology, Mr William D Hill, secretary of the laboratory, Henry A Ingraham and Henry C Turner.

**Society News**—Dr Russell L Cecil addressed the Medical Society of the County of Queens January 25 on "Treatment of the Various Forms of Arthritis". Dr Morris Fishbein, Chicago, Editor of THE JOURNAL, will be the speaker February 24. Drs Louis A Bue, Rochester, Minn., and Mervin C Myerson, Brooklyn, addressed the Medical Society of the County of Kings, January 18, on "Problems in Proctology Encountered by the General Practitioner, the Internist and the Surgeon" and "Studies to Evaluate the Zinc Sulfate Spray in the Prevention of Poliomyelitis" respectively. Dr John B D'Albora delivered his official address as incoming president of the society on "Medicine in a Changing Social Order". A program on tuberculosis was presented before the Brooklyn Thoracic Society January 21 by members of the tuberculosis service of the Kingston Avenue Hospital, as follows: Drs Henry D Fearon, Harry Meyersburg, Abraham V Shapiro, Anthony W Martin, Marino, Alfred M Buda and Isaac Skir. Dr John H Garlock addressed the New York Surgical Society January 26 on "Differential Diagnosis of Hyperparathyroidism".

## OHIO

**Anniversary Program at State University**—The annual Founder's Day Program of Ohio State University College of Medicine, Columbus, will be presented March 3-5. Sessions are open to the medical profession, as well as alumni. Ninety-six members of the faculty and their associates appear on the program which begins with an open house the first morning for conferences with the visitors. Thursday afternoon and evening the program will be presented at the University Hospital, including among other features reviews of research in the various departments of the college. Dr John H J Upham, dean of the college and President of the American Medical Association, will preside at the evening session. Friday there will be several simultaneous sessions in the medical college building and Friday evening the annual Alpha Omega Alpha Lecture will be delivered by Dr Karl A Menninger, Topeka, Kan., on "The Scientific Study of Personality". Saturday morning Dr James C Sargent, Milwaukee, of the class of 1915 now president of the State Medical Society of Wisconsin, will be a guest speaker on "The Present Challenge to the

Medical Profession" Dr Upham will also speak at this session on "The Progress of the College of Medicine" Alumni reunions and class luncheons will be held Saturday noon at the Deshler-Wallick Hotel, and the final session will be at the St Francis Hospital with Dr John E Rauschkolb, Cleveland, as guest speaker, on "The Adequate Treatment of the Syphilitic Patient" Fraternity banquets in the evening will end the program The committee on graduate assemblies is as follows Drs Russel G Means, Jonathan Forman, Verne A Dodd, Charles A Doan, Herbert M Platter and Noel Paul Hudson, all of Columbus

### OREGON

**Dr Kinney Honored**—Dr Alfred C Kinney, Seaview, Wash, the first and the fiftieth president of the Oregon State Medical Society, received the honorary degree of doctor of laws at a celebration of the eightieth anniversary of Linfield College, McMinnville, January 30 Dr Kinney was at one time a student at the college The day was his eighty-eighth birthday Olof Larsell, Ph D, Portland, presented Dr Kinney for the degree and Dr Ralph A Fenton, Portland, Trustee of the American Medical Association, congratulated him on behalf of organized medicine In 1874 Dr Kinney was elected president of the state medical society, of which he was the founder, and in 1924 he became the fiftieth president He was active for many years in the civic life of his community, Astoria, and was one of the first members of the Oregon State Board of Health He graduated from Bellevue Hospital Medical College, New York, in 1872

### PENNSYLVANIA

**Society News**—Dr John P Tucker, Cleveland, addressed the Cambria County Medical Society, Johnstown, February 10, on "Diagnosis and Treatment of Peptic Ulcer"—An obstetric and pediatric institute was held in Williamsport, February 11, under the auspices of the Lycoming County Medical Society with the following speakers, all of Philadelphia Drs Mary K Bazemore, Elizabeth K Rose, Ruth Stephenson, Lida S Cogill, Clayton T Beecham and James F Carrell—Dr Clarence A Crumrine, Washington, addressed the Washington County Medical Society, February 9, on control of pneumonia in Pennsylvania—Dr George J Kastlin, Pittsburgh, addressed the Fayette County Medical Society, Umontown, February 3, on pneumonia

#### Philadelphia

**Medical Bequests of Publisher**—Arthur H Lea, a retired partner of the medical publishing firm of Lea and Febiger, who died January 7, left several large bequests to Philadelphia medical institutions The Children's Hospital is to receive \$100,000 to establish an orthopedic department, Jefferson Medical College \$50,000 for research on streptococcal infections, Pennsylvania Hospital and the College of Physicians of Philadelphia \$50,000 each

### UTAH

**Society News**—Dr John G McQuarrie, Richfield read a paper on his recent observations of English and French hospitals and clinics before the Weber County Medical Society in Ogden recently—Dr Robert J Alexander, Salt Lake City, addressed the Southern Utah Medical Association at Salina, January 5, on plastic surgery—The Salt Lake County Medical Society was addressed January 10 by Drs Theodore C Bauerlein on "Achalasia or Incoordination of Cardiac Sphincter" and Dr Frank M McHugh, "Acute Laryngeal Tracheal Bronchitis"

### VIRGINIA

**Personal**—Dr John B H Bonner, Stony Creek, health officer of Sussex County, has been made director of a new health district in Prince George County with headquarters in Hopewell—Dr James M Suter, Washington, D C has been appointed health officer of Lee County and Dr Williams W Fuller, Christiansburg of Montgomery County

**New Tuberculosis Hospital**—The Tidewater Memorial Hospital, near Lynnhaven, was opened for patients Dec. 27, 1937, with Dr Elizabeth C Cole, Norfolk acting as medical director and Miss Bethea Craft as superintendent The hospital is intended for persons with advanced tuberculosis but it will as far as possible admit all patients from the second congressional district Funds to build the new hospital were contributed from all parts of the district, according to the *Virginia Medical Monthly* It has a capacity of fifty beds

### GENERAL

**Cruise and Golfers' Special Train to San Francisco**—A five and one-half day ocean voyage has been arranged to start June 1 from New York for New Orleans, to meet the "Golfers Special" train for the annual session of the American Medical Association in San Francisco The S S *Dirigo* will arrive in New Orleans June 7 Sponsored by the American Medical Golfing Association, the "Golfers' Special" will feature six games of golf on the trip to San Francisco and include sightseeing stops in New Orleans, Houston, Galveston, San Antonio, Los Angeles and Del Monte The twenty fourth tournament of the association will be at the Golf and Country Club, San Francisco, June 13 On the return journey of the special through Portland, Seattle, Vancouver, Lake Louise and Banff, two games of golf and an all day boat trip up Puget Sound will be enjoyed Nongolfers as well as medical golfers and their ladies will be welcome on the "Golfers' Special," and it is announced that the choice of routes is optional

**Impostor Continues to Defraud Pathologists**—Reports continue to be received of the fraudulent activities of the impostor who poses as a pathologist and thus induces pathologists in many cities to cash checks for him He has been using the name of Dr Clarence S Moran, assistant professor of pathology at Creighton University School of Medicine, Omaha, and has been in Indianapolis, Denver, Ogden, Utah, and Portland, Ore Descriptions of the man correspond with that of a man impersonating Dr Eustace L Benjamin, whose travels were described in a news item in THE JOURNAL, Dec 25, 1937, page 2148 Hotels in Ogden and Portland have recently sent to the real Dr Moran statements for hotel bills left unpaid by the impostor Recently the Post Tavern, Battle Creek, Mich, announced that a man using the name Marvin St Clair had swindled physicians in Battle Creek in the same way, this hotel offers a reward of \$25 for the apprehension of the man and will be glad to prosecute The description given tallies closely with that given in other reports and in THE JOURNAL He is about 40 years old, is 5 feet 10 inches tall, weighs about 170 pounds, and has dark curly hair and light gray or blue eyes He has a familiarity with laboratories and speaks convincingly of pathologists, according to all reports Dr John L Lattimore, Topeka, Kan, writes that he would appreciate a telegram or telephone call from physicians when the impostor next appears

**Prize in Obstetrics, Gynecology and Abdominal Surgery**—The \$500 prize recently announced by the American Association of Obstetricians, Gynecologists and Abdominal Surgeons is to be known as the "Foundation Prize" The award will be made at the annual meetings of the association, at which the successful contestant must appear in person to present the contribution as part of the regular program He must meet all expenses incident to the presentation The thesis will become the property of the association, but this provision shall in no way interfere with publication of the communication in the journal of the author's choice Unsuccessful contributions will be returned Eligible contestants include only (a) interns, residents or graduate students in obstetrics, gynecology or abdominal surgery and (b) physicians who are actively practicing or teaching one of those subjects Manuscripts must be limited to 5,000 words and must be typewritten with double spacing on one side of the paper and with ample margins Illustrations should be limited to such as are required for a clear exposition of the thesis Manuscripts must be presented under a nom de plume with a sealed envelop bearing the nom de plume and containing a card showing the name and address of the contestant All manuscripts must be submitted before June 1 to the secretary of the association, Dr James R Bloss, 418 Eleventh Street, Huntington, W Va

### CANADA

**Invitation to Canadian Medical Association Meeting**—The sixty-ninth annual meeting of the Canadian Medical Association will be held in Halifax, N S, during the week of June 20-24 Headquarters will be at the Nova Scotian Hotel Members of the American Medical Association are cordially invited to attend the meeting On presentation of a card indicating membership in the American Medical Association at the registration desk American physicians will be given a guest card entitling them to all the privileges of the convention

### CORRECTION

**Calcinosis Cutis**—In THE JOURNAL, January 29 page 362 in the fourth line from the end of the paragraph on "Prognosis" the word "stimulate" should have been "simulate."



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 22, 1938

#### A Criticism of the British Health Services

Never before has so much public attention been given to the question of the health of the nation. The government is taking an active part in health propaganda and the press almost daily contains articles telling people how to keep fit by various methods—drinking more milk, taking more exercise, not worrying. If health could be secured by propaganda, there should be little for physicians to do. An independent nonpartisan group of persons interested in sociology has published an exhaustive survey of the British health services which has taken three years to accomplish and is a mine of accurate information. We are told that about a billion dollars is spent annually on the maintenance and treatment of the sick and measures of prevention. Nineteen thousand panel physicians give some fifty million attendances annually to nineteen million insured persons. More than five million people voluntarily make payment of a few cents a week to hospital contributory schemes which gives them a right to treatment if they should require it. One thousand voluntary hospitals treat one and one-fourth million inpatients and five and three-fourth million outpatients a year. More than three million children are given milk gratuitously in schools, and the health of school children in England and Wales is looked after by the equivalent of 706 whole time physicians.

On the working of the health services there is some sound criticism. "The needs of the individual or family in health matters," we are told, "vary so much and call for so much experience and judgment that they can in practice only be intelligently and sympathetically determined by a person who is acquainted with the medical record and the environment of the person requiring attention. In other words only the general practitioner can keep track of the resources of the health services on the one hand and the peculiarities and needs of the individual 'consumer of health services on the other'." But "to a large and growing extent the uninformed consumer with no equipment for making a sound choice is being permitted, encouraged or even compelled to decide for himself whether he needs to get in touch with any part of the health services and, if so, how and which of them. Owing to social changes a growing number of people have no regular health adviser. It is disturbing to find large numbers of general practitioners being taught at great trouble and expense to use modern diagnostic equipment, to know the available resources of medicine and to exercise judgment as between patient and specialist, only to be launched into a system which too often will not permit them to do their job properly. If the drift towards a confused mass of conflicting specialisms is to be stemmed, the position of the general practitioner must be so adjusted that he can give the community the benefit of his training and potentialities and can develop and exercise judgment. Excessive numbers of panel patients and excessive demands for certificates and returns of all kinds quickly reduce the general practitioner to an agent for making out prescriptions and for operating something more like a sickness licensing and registration system than a health service." A reorientation of the health services is therefore demanded. It implies general efforts to promote healthy living and thus reduce to manageable proportions the number of sick requiring treatment. It implies preference for domiciliary over institutional treatment wherever conditions are suitable and checking the uncontrolled spread of badly coordinated specialist agencies.

The fundamental defect in the existing system is stated to be its preoccupation with manifest diseases or disabilities and its greater interest in enabling sufferers to go on functioning in society somehow instead of studying the nature of health and the means of producing and maintaining it. Millions are spent in looking after and trying to cure the victims of accidents and illnesses which need never have occurred if a fraction of this amount had been devoted to tracing the social and economic causes of the trouble and making the necessary adjustments.

The following recommendations are made. 1 Existing health services should be better used not only by the public but by other health services, which often work in watertight compartments. 2 The improvement of nutrition should be pushed forward as an insurance against future ill health, especially by extending the milk scheme. 3 National health insurance should be extended to cover dependents of the insured. 4 Much more research should be done, not only on the medical but on the social and economic causes of ill health, for instance, strain in factories and ill health caused by excessive journeys to work, and also on defects in the health services.

#### Cullen's Sign Due to Rupture of Cesarean Section Scar

At a meeting of the North of England Obstetrical and Gynecological Society Dr E. A. Gerrard described the occurrence of Cullen's sign under circumstances that do not appear to have been observed previously. This sign has always been regarded as due to rupture of an ectopic gestation. The patient was a secundipara aged 33 whose pregnancy had reached the thirty-seventh week. Three years previously she was delivered by upper segment cesarean section. Her present pregnancy was uneventful up to the thirty-sixth week, when she began to feel aching pain in the lower part of the abdomen. She visited an antepartum clinic with the history of an attack of acute cutting pain which lasted four hours. Soon afterward she noticed a reddish stain at the umbilicus. Now her only complaint was a slight feeling of soreness.

On examination her general condition was found to be excellent. The abdominal swelling corresponded to the period of amenorrhea. An operation scar began 2 inches above the umbilicus, skirted this on the left side and extended downward for a further 6 inches. The umbilicus showed a reddish purple stain about the size of a shilling. Palpation revealed the child lying in the left sacro-anterior position. The pelvic measurements were interspinous  $9\frac{1}{2}$  inches (24 cm), intercrural  $10\frac{1}{2}$  inches (26.5 cm), diagonal conjugate  $4\frac{1}{4}$  inches (11 cm). There was a low pubic arch. The fetal heart sounds were good. Despite the patient's excellent condition, Cullen's sign was deemed to indicate intraperitoneal hemorrhage and a ruptured cesarean scar was diagnosed.

The abdomen was opened through a right paramedian incision. The peritoneum in the umbilical region was seen to be infiltrated with blood. There was no free blood in the peritoneal cavity, but a clot was found attached to the old uterine scar. The clot was removed, exposing a tear one inch long, which had been effectively plugged by the placenta, lying beneath. The site of rupture was extended with scissors and the patient was delivered of a  $7\frac{1}{2}$  pound (3,400 Gm) child, which breathed a moment or two later. The old scar, which was very thin, was excised and the uterus was sutured.

There has been some speculation as to the mode of production of Cullen's sign. An English gynecologist suggested (Stabler, Frank. A Case Showing Cullen's sign, *Brit M J* 2 255 [Aug 11] 1934) that breach of continuity of the parietal peritoneal endothelium is necessary, through which ecchymosis occurs into the subcutaneous tissues. He considered that the umbilical scar was a point at which such a breach was most



likely to occur and that the infrequency of the sign indicated that it was associated with some unusual anatomic feature. Dr Gerrard was inclined to think that in his case there must have been damage to the peritoneum at the time of rupture of the uterine scar. He also thought that the attachment of the placenta to the anterior wall of the uterus predisposed to scar rupture, as was pointed out some years ago by another English gynecologist, Mr St George Wilson.

### Drug Addiction in Great Britain

In an address before the Society for the Study of Inebriety, Dr W N East, commissioner of prisons, stated that there were known to the government 616 narcotic drug addicts in Great Britain, 313 men and 303 women. He also spoke of the great decrease in recorded drunkenness since the war. In the four years 1910-1914 an average of 193,354 persons annually were charged with drunkenness, but in 1935 the number was only 48,110. Dr A E Carver, medical superintendent of an institution dealing with alcohol and drug addicts, said that delirium tremens was seldom seen now.

### PARIS

(From Our Regular Correspondent)

Jan 22, 1938

### Laws Governing Social Medicine in France

In reply to an inquiry received from Yugoslavia, an abstract of the laws governing social medicine in France appears in the Dec 26, 1937, issue of the *Concours medical*.

The chief features of this abstract are

#### MEDICAL CARE

(a) Free medical care. The law of 1893 bestows on those unable to pay for medical services the right to ask for them. The applicant for medical care can choose a physician, who is reimbursed by the collectivity, according to a fee table established by the prefect of each of the ninety departments and the representatives of the medical profession of the respective department. Professional secrecy forms a part of this contract between the government and the profession. In case hospitalization is necessary, the indigent patient is sent to a public hospital but is not obliged to accept hospitalization.

(b) Industrial accidents. At first applicable only to workers in factories, the original law has been modified to include those engaged in agricultural pursuits and domestic servants. A large number of occupational diseases are now included as subject to indemnification. Reimbursement for industrial accidents is made by the employer, who can protect himself by insurance in companies approved by the government. The worker can choose his medical or surgical attendant and is not obliged to accept the services of the physician or surgeon selected by the employer, but the latter has the right to have the treatment controlled.

(c) Care of war veterans. A soldier drawing a pension has the right to choose his medical attendant, whose services are reimbursed by the government, subject to control by a committee representing the profession and the government.

(d) Social insurance. The original 1928 law has been revised many times. Any worker receiving less than 30,000 francs (\$985) a year is obliged to participate in social insurance. The premiums are payable every three months, one half by the employer and the other half by the worker. The employer must remit this premium to the local insurance bureau and is responsible for the entire premium. If the employer fails to collect the worker's share of the premium or fails to fill out blanks showing that the employee is insured, the employer is subject to a fine. The worker's share of the premium is equal to

8 per cent of his total earnings during the three months period for which the premium is paid. The insured has free choice of the medical attendant in France and must pay the attending physician according to a fee table agreed on by the insurance bureaus, or caisses, and the medical profession. The insured is reimbursed to the extent of 80 per cent of outlays for medical services. The insurance bureaus, or caisses, have the right to control the treatment in any given case by medical inspectors chosen by the caisses. During 1935 nearly a billion francs (about 44 million dollars) was paid by the social insurance organization for medical services to workers.

(e) Insured workers unable to pay for medical care. If a worker previously insured is found to be unable to pay for medical services, the physician is paid by the local collectivity, who in turn is reimbursed to the extent of 80 per cent of any outlay by the social insurance bureaus, or caisses.

#### PREVENTIVE MEDICINE AND HYGIENE

(a) General hygiene. Formerly the duty of the heads of collectivities, a law passed in 1935 now places responsibility for all sanitation on the prefect of each department. The latter appoints inspectors of hygiene. Every city having a population of 20,000 is obliged to have a health department.

(b) Aid and hygiene. Every woman worker has the right to quit work during pregnancy without the risk of losing her place. No woman can be employed until four weeks after delivery. Illegitimate children or those whose parents have been sent to prison or who are chronic alcoholic addicts are placed in special centers under government control. Any person above the age of 70 years and unable to work receives an allowance equal to 3,000 francs a year, which shall include any income from private resources.

(c) Preventive medicine. Vaccination during the first year and revaccination between 11 and 21 years is obligatory. A law governing compulsory notification and treatment of venereal diseases has been in force since 1935. Dispensaries for the detection of pulmonary tuberculosis at an early stage and the establishment of public sanatoriums for those unable to pay for treatment have been established by laws passed in 1916 and 1919. Medical inspection of schools is left to the discretion of individual collectivities and is not yet obligatory. An effort is being made to coordinate the work of public and private agencies engaged in preventive medicine. Another question that is being studied is the creation of health centers to supervise periodic examination of every individual at the ages of 15, 20, 45 and 50 years. These centers should receive the cooperation of the local medical profession under supervision of their county societies.

### Chemotherapy in Gonorrhea

The minister of public health has organized a conference on the results of the treatment of gonorrhea by chemotherapy. The first meeting will be held in March to prepare a program for the meeting of the international congress to combat the venereal diseases to be held in April. A second meeting of the French society will take place in December and will aim to evaluate the chemotherapy of gonorrhea. The papers to be read at the March meeting include (1) internal chemotherapy of gonorrhea from the chemical and experimental standpoint by Professor Levaditi, director of the experimental chemotherapeutic laboratory of the Alfred Fournier Institute of Paris; (2) therapeutic clinical results in male gonorrhea by Dr Milian of Paris and Prof Lautrier and Dr Laugier of Strasbourg; (3) results in women by Drs Fernet and Durel of Paris and Professor Fayre and Drs Lacassagne and Jambon of Lyons. Professor Gougerot, specialist in venereal diseases at the Hôpital Saint Louis of Paris, will preside at the March conference.

### Prof Rene Leriche Appointed to College de France

Prof Rene Leriche, whose contributions to neurosurgery have won for him an international reputation, was a candidate for the chair of medicine in the College de France. The latter is an institution devoted to research work and is not connected with the Paris Medical School, although its faculty is a part of the Sorbonne, or University of Paris. Professor Leriche has now been definitely appointed to the chair of medicine in the College de France, as successor of the late Prof Charles Nicolle. The physiologist Claude Bernard was one of the earlier professors to occupy this chair of medicine. Professor Leriche will have every facility to continue the study of surgical research problems, being relieved of all clinical work.

### BERLIN

(From Our Regular Correspondent)

Dec 27, 1937

#### The Campaign Against Alcoholism

The increase in consumption of beer in Germany has continued uninterruptedly since 1933. During the period from July 1, 1936, to June 30, 1937, an increase of nearly 5 per cent took place. The statistics disclose regional difference in this regard. The greatest increases in the amount of beer consumed were reported from industrial areas.

The regulation of pharmaceutical advertising now specifically forbids the commercial application to spirituous and other alcoholic beverages of misleading names which suggest a medicinal value. These misleading terms cannot be regarded merely as coined trade-names, since they carry with them the suggestion of medicinal efficacy. The use of these terms accordingly becomes a public health question.

The Dresden postoffice administration, which supervises all Saxony, has sent to all industrial plants and places of refreshment within its territory a warning against the use of alcohol, which must be publicly displayed on the premises. This notice contains such propaganda statements as "Alcohol is responsible for a majority of traffic, industrial and other accidents."

All nonconfessional adherents of the abstinence movement in Germany have formed a united "German League to Combat the Alcohol Menace." This league held its inaugural session late in October. Among those present were leading government and party officials as well as representatives of various professions. At about the same time a conference on the "Care of Alcohol Addicts" was held, at which it was decided to amalgamate all public and private agencies concerned with this work into an "Association of Welfare Agencies for Alcohol Addicts and for Persons Threatened with Addiction." Thus a complete unification of these agencies has been achieved.

#### The Cancer Problem

The present status of the cancer problem was discussed recently in the Medical Society of Frankfurt-on-the-Main by Professor Fischer-Wasels, ordinarius in pathologic anatomy. He said that about twenty-five years has passed since the first experimental production in animals of genuine, malignant neoplasms. He stressed the role that mutation seems to play in the transformation of normal body cells to cancer cells. So far no one has been able to isolate a specific agent of virus like substance from cancer cells and to produce experimental cancer with it. Of extraordinary importance is the established fact that a state of general predisposition always precedes the manifestation of cancer. The exact basis of this predisposition is not understood; it is certainly in some way related to modification of the bodily metabolism. Fischer-Wasels regards heredity as a significant pathogenic factor in cancer.

The final speaker was Prof E Hoffmann of Bonn, former director of the dermatologic clinic there. His theme was the

problem of virus and cancer. Chronic irritation sets up a precancerous condition. The diseases most closely associated with the production of virus (smallpox, venereal lymphogranuloma, molluscum contagiosum) have as principal pathologic sequels the formation of proliferative, inflammatory and degenerative processes. The latter are best demonstrated by illuminated field method and fluorescence microscopy. Cancer in man apparently cannot be induced by virus. At present, cancer can be termed neither an infectious nor a virus disease. The better rationale is to assume first an irritation that leads to a precancerous state and deficiency of impulse and then the manifestation of carcinoma conditioned by abnormal karyolytic, negative or mutational processes, the entire phenomenon influenced by heredity. In the war against cancer it becomes necessary to maintain the human organism as free as possible from cancerogenic irritation in the hope of counteracting the influence of hereditary predispositions.

#### A "University City" for Berlin

A number of institutions of university rank are located at Berlin: the university proper, the College of Technology, Agricultural College, Veterinary College and so on. These institutions are among the foremost in Germany both because of the vast extent of activities and because of their ranking in the world of scholarship. These institutions are scattered haphazardly throughout the city. Gradually they have outgrown the buildings in which they are housed. It is now planned to establish a "University City" in the Grunewald section. Competitive bids for the construction of this project are now in order. The principal units of the new group will be the scientific and academic departments of Berlin University, the hospitals, the College of Technology, and the Academy of Military Medicine. (The Veterinary College is to become a part of the university.) Ground for the new buildings will not be broken until 1939, since it will be some time yet before the plan attains its definitive form.

### SWITZERLAND

(From Our Regular Correspondent)

Jan 6, 1938

#### The Anticancer Campaign

The organized anticancer campaign in Switzerland rounded out a quarter century of activity in 1935. Ernst Hedinger, professor of pathology at Berne, began to organize this movement in 1910, yet, as Dr P Jung of St Gall, president of the Schweizerische Vereinigung für Krebsbekämpfung (Swiss Anticancer League) recently remarked, Switzerland remains in the forefront with regard to incidence of cancer. It is uncertain whether this statistical increase is based on actual greater frequency of the disease or on the recognized completeness and accuracy of Swiss mortality statistics. From 1933 to 1935 the federal health bureau conducted a "cancer survey," the results of which have just been published. The survey was based on data from 8,861 answers to questionnaires from hospitals and individual practitioners. If such data are considered a valid statistical foundation, one may safely assume that the true incidence of cancer cases is increasing. The data lead one to infer that many persons with cancer never find their way to the doctor or to the hospital. Cases in the younger age groups seemed to be on the average more adequately recorded. A large number of persons affected with cancer visit the cancer quack in preference to the doctor, since the quack, taking advantage of a fear of operations, promises a cure without surgical intervention. In any event the number of instances in which cancer is first detected post mortem is formidable.

The cancer problem is further illustrated in a recent report of the federal bureau of statistics. This study deals with

cancer mortality during two nonconsecutive four year periods, namely, the years from 1909 to 1912 and the years from 1929 to 1932. The figures for all Switzerland according to particular age groups are shown in the accompanying table.

A more intensive survey of the records of the individual cantons shows that mortality statistics based on the population as a whole are unreliable, since they erroneously indicate an

*Deaths from Cancer in Switzerland*

Age Group	Mortality per 10,000 of Population in Same Age Group			
	Males		Females	
	1909-1912	1929-1932	1909-1912	1929-1932
40-49	11.2	8.2	12.4	10.0
50-59	36.4	34.2	30.5	27.8
60-69	84.7	82.6	61.7	56.6
70 and over	114.2	141.2	95.5	104.2

increase in the number of cancer fatalities. The present report emphasizes this consideration. The favorable decline in cancer fatalities from 37.9 (in 1909-1912) to 37 (in 1929-1932) per 10,000 living females in the age groups 40 and over has not been sufficiently emphasized. The recession in cancer fatalities in all age groups under 70 is also worthy of note.

#### The Marcel Benoist Prize

Since 1920 there has been in Switzerland a richly endowed prize, known as the Marcel Benoist prize, for notable contributions to science. Shortly before the war Marcel Benoist, the French jurist, willed a part of his fortune to the government of Switzerland with the provision that the income from it be devoted to a prize for scientific achievement, to be awarded annually. When Benoist died in 1918 the Swiss Federal Council came into this inheritance. In 1920 was established the "Foundation Marcel Benoist pour l'encouragement des recherches scientifiques" with its headquarters in the Federal Department of the Interior, Berne. The foundation's capital amounted in 1920 to a round million of Swiss francs. The prize awarded each year from the income was at first 40,000 francs (about \$9,000) but at present, owing to depreciation of the foundation's securities, it amounts to 30,000 francs (about \$7,000). A single prize is awarded to the scientist of Swiss nationality (or to a foreigner resident in Switzerland for at least five years) who in the course of the preceding year, through research discovery or investigation, has contributed most importantly to science and especially to an improvement in human existence. A savant may enter himself as candidate for the prize or his name may be proposed by a university or some other recognized Swiss organization or by individual members of the foundation's directorate. The board of directors comprises twelve members who meet each year to determine the prize winner for the preceding year. Each candidate proposed is thoroughly investigated. Prizes have been awarded since 1921. The first man to receive the award was Prof. M. Arthus, at that time professor of physiology in Lausanne, he was selected in recognition of his research on anaphylaxis. Some prize winners of subsequent years and the fields of endeavor were Prof. M. Askanazy of Geneva, experimental carcinoma, Professor Doerr of Basel, filtrable viruses, Dr. Eugster of Zurich, research on goiter, Professor Gonin of Lausanne, operation for ablation of retinae, Prof. W. R. Hess of Zurich, regulation of respiration and circulation, Dr. Alois Müller of Fribourg, research on the circulation, Professor Sahli of Berne, textbook of methods of clinical examination, Professor Zangger of Zurich, intoxication, Professor Karrer of Zurich, vitamin syntheses. Among others rewarded were several mineralogists and geol-

ogists. The 1936 prize has just been awarded Prof. Dr. A. Vannotti of Lausanne in recognition of his valuable research investigations of porphyrin and porphyrin diseases.

#### Adolf Loewy Is Dead

Prof. Dr. Adolf Loewy died recently in Davos, aged 70. Born in Berlin, Loewy served there for many years as a physiologist. Together with Professor Zuntz, he undertook extensive research on the mechanisms of respiration and circulation with special reference to the physiologic effects of variation in pressure and oxygen content of the air. Loewy and Zuntz made many studies of human metabolic reactions (carbon dioxide, oxygen and so on) to high altitudes and mountain climbing. In 1922 Loewy became director of the physiologic section of the Institute of Alpine Physiology and Tuberculosis Research at Davos. Among other things, he demonstrated that mountain sickness and other effects of high altitude are imputable to oxygen deficiency and on the other hand that the salubrious stimulating effect of the high altitude is in great part due to diminution of oxygen and rarefaction of the air. Together with his collaborators, who were always present in numbers at Davos, Loewy investigated the influence of oxygen deficiency on the blood, hematopoiesis, basal metabolism, conservation of energy and the nervous system. Many of their observations have been of importance to aviation. Loewy may be regarded as a truly great investigator of alpine physiology. Among his authoritative publications were a monograph on climatophysiology published in Germany in 1931 and another on the pathology of alpine climate published in London in 1937. Even in his Berlin days Loewy had acquired distinction through his co-authorship (with Zuntz) of a textbook of physiology, several editions of which were published.

#### ITALY

(From Our Regular Correspondent)

Jan. 8, 1938

#### Congress of Urology—Urinary Calculi—Renal Resection

The Italian Society of Urology held its sixteenth national convention at Turin. The first theme was medical and dietary management of urinary calculosis. The speakers were Prof. Pavone of Palermo and Ascoli of Milan. Pavone stated that the problem of medical therapy of urinary calculi is complicated by a diversity of opinion and by peculiar therapeutic and diagnostic difficulties. Whatever the therapeutic approach, three principal objectives are envisaged: relief of pain, elimination of the concretions and removal of the condition that predisposes to the formation of calculi. The author stated, on the basis of observation of many cases, that there is no known medication capable of dissolving urinary, uric and oxalic calculi. Only in particular cases is it possible to effect expulsion of the concretions through the urinary tract by means of medical therapy. Medical measures should be directed not so much to the eradication of formed calculi as to the prophylaxis of the disorder. In other words, the constitutional diathesis should be combated. Among other prophylactic measures, the author mentions movement, gymnastics, hydrotherapy, cremona therapy and special diets. Although no known substance possesses specific effect, medications may be helpful in the control of diuresis. For treatment of the phosphatic diathesis, acidifying medicaments and a ketogenic diet are of value.

Professor Ascoli reviewed the various explanations of the pathogenesis of lithiasis: urinary, phosphatic, oxalatic and carbonatic. He considers these conditions localized manifestations of a general constitutional disorder rather than as isolated phenomena. From personal study of phosphatic precipitation

in various diseases, the author has come to regard alkalimuria as a more prevalent factor than either calciuria or phosphaturia. Ascoli differentiates two categories of urethral lithiasis, in the first he includes the essentially hyperkinetic and hypertonic forms and in the second the hypokinetic and hypotonic forms. In disorders of the first type the use of antispasmodic agents is paramount. In disorders of the second class, medications which tend to increase urethral kinesis should be administered. In discussing dietetic therapy, the author reminded his hearers of the importance of a regimen deficient in calcium but rich in phosphorus for patients affected with phosphatic and carbonatic calculi. The author discussed the problem of urinary acidification, he stresses the practical importance of this factor above all in its relation to surgical treatment and to recidivation.

The second theme was renal resection. The speakers were Professors Lilla of Leghorn and Ravasini of Padua. Lilla pointed out that the literature of this topic was poor in clinical observations. He avoided discussion of surgical cases in which double kidney pelvis, double ureters or horseshoe kidneys were presented, limiting his remarks to the problem of resection of the kidney having a single pelvis and ureter. The author believes that only in cases of the last named type can one correctly speak of true resection, the excision of certain parts of an organ. In the other cases, wherein the entire autonomous kidney is involved, it is more suitable to speak of total nephrectomy than of renal resection. The polar stones are among the clinical indications for resection. This type of intervention has provided a new horizon to the conservative surgery of renal calculus. It also tends to relieve urinary stasis and this is of great importance in the prophylaxis of recurrence. The author experimented to ascertain whether resection is in fact a conserving operation, namely, whether the secretory functions and the kinetic tonus of the excretory passages were in any way impaired by it. He concludes that parenchymal function remains unmodified and excretory function is markedly improved, temporarily at least. It has been impossible to state with certitude that resection diminishes the danger of recidivation. An affirmation in this regard would be of the first importance, providing as it would a key to the precise evaluation of diverse factors that underlie recidivation, such as stasis, infection and the lithogenic diathesis. Lilla also attempted to determine to how great an extent the intervention was free from accidents such as hemorrhages or fistulas. He concluded that, if skilfully performed, the operation was no more perilous than a pyelotomy or a nephrotomy performed with the same degree of technical precision. The author also considers resection a possible indication in caliectasia dolorosa. The operation has been performed relatively often in such cases and Lilla himself has accumulated data which, although not abundant, are encouraging.

Professor Ravasini discussed his studies of renal resection. He has observed that healing of the resection wound takes place by proliferation and cicatricial organization of both the pericanalicular connective tissue and that of the fibrous capsule, it was impossible to demonstrate with certitude a regeneration of the more important parenchymal elements, which might lead to the formation of new glomeruli and new tubules. Vicarious hypertrophy develops with an intensity about proportional to the amount of parenchyma excised in the resection. This hypertrophy is minimal if the tissue lost represents between one fourth and one third of the entire renal tissue, it assumes its greatest proportions following extensive resections such as would involve a loss of from two thirds to three fourths of the parenchyma. The hypertrophic process is manifest within a few days after the intervention and it becomes complete in from thirty to forty days. A corresponding

enlargement of the vascular rete accompanies the hypertrophic development. As to postoperative behavior of renal functional capacity, Ravasini found that the excision of a part of the inferior parenchyma did not induce permanent modifications of emunctory global function as a whole. Only the functional capacity of the resected kidney was influenced, that of the other remaining unchanged. The permanent diminution of functional capacity which follows resection of the renal parenchyma is comparable to that which follows unilateral nephrectomy. If an extensive resection is performed, for example, three fourths of the parenchyma, marked functional alterations will follow, characterized by albuminuria, polyuria and retention of nitrogenous waste products. Frequently this condition is accompanied by an elevation of blood pressure and enlargement of the heart. The changes, which are generally permanent, can to some extent be mitigated by the timely use of a restricted dietary.

The minimal quantity of renal parenchyma found to be necessary to life differed in the various animal species used in experimentation. Female goats were able to survive if only from 10 to 20 per cent of the parenchyma remained. The minimal proportion of residual parenchyma necessitated by other species was 17 per cent for the rat and from 25 to 35 per cent for the rabbit, the dog and the cat. These figures represent the extreme limits of survival following excision of renal tissue, each of the experimental animals was submitted to a series of resectional intervention, and intervals between operations were long enough to permit development of a satisfactory vicarious hypertrophic process.

The principal papers were followed by contributions on a diversification of topics. Gallizia of Turin has studied the renal functional capacity of hepatopathic patients whose kidneys were normal, he concluded that nearly all the tests of renal function are deficient. He makes an exception of the maximal urinary concentration test. Gallizia concludes that there is no direct relation between functional capacity of the liver and the kidneys. Pisani of Milan discussed surgery of the solitary kidney. On the basis of his thirty-three cases he concluded that the indication for surgical intervention in this condition may be urgent. However, he found that some cases permit a choice of procedure. If the indication is not clear, the doctor, guided by the sum of our diagnostic and surgical knowledge of these conditions ought to consider all the possible surgical and nonsurgical therapeutic procedures.

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## Marriages

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SNOWDEN COWMAN HALL JR, Danville, Va, to Miss Ida Shankle Hardman of Commerce, Ga, at Durham, N C, Dec 28, 1937

WILLIAM WARREN BABSON, Gloucester, Mass, to Miss Anne Odeneal Wilbon of Richmond, Va, Dec 11, 1937

MAUREI BROWNSTONE, Sandstone, Minn, to Miss Dorothy Jane Margulies of Minneapolis, Nov 2, 1937

ROBERT WILSON BARTLETT, St Louis, to Miss Louise McGehee of Memphis, Tenn, January 5

JOHN CONANT WEED, New Orleans, to Miss Alice Lemann of Donaldsonville, La, in November 1937

ROBERT M BAKER, Jacksonville, Fla, to Miss Claire Henderson of Tampa, Dec 15, 1937

CLAUDE E CARTER, Spokane, Wash, to Mrs Borghild Pedersen of Seattle, Dec 28, 1937

LINDLEY L BUCKIN, to Miss Irene Johnson, both of Wenona, Ill, Dec 26, 1937

FRANK CERULLI to Miss Anne Anastasio, both of Brooklyn, January 9

## Deaths

**Harry Vanderbilt Wurdemann** ☉ Seattle, Columbian University Medical Department, Washington, D C, 1888, practiced in Milwaukee from 1890 to 1909 and in Seattle since 1909, secretary of the Section on Ophthalmology of the American Medical Association, 1894-1895 and chairman, 1899-1900, and member of the House of Delegates in 1902, 1906 and 1914, professor of ophthalmology at the Chicago Eye, Ear, Nose and Throat College, 1894-1909, and the Milwaukee Medical College, 1900-1909, member of the American Academy of Ophthalmology and Oto-Laryngology and the Pacific Coast Oto-Ophthalmological Society, fellow of the American College of Surgeons, past president of the Puget Sound Academy of Ophthalmology, advisory member of the National Committee for Prevention of Blindness, served as medical examiner in aeronautics for the U S Department of Commerce and as flight surgeon in the U S Army Air Corps, formerly president of the Reserve Officers' Association of Washington, at various times editor of *Annals of Ophthalmology* managing editor of *Ophthalmology*, associate editor of *Ophthalmic Record* and the *American Journal of Ophthalmology*, author of chapters in textbooks on ophthalmology and of articles in scientific periodicals, aged 72, died, January 30, in the Maynard Hospital, of carcinoma of the bronchus and arteriosclerosis

**Leonard Klinck Stelle**, Dryden, N Y, Chicago Homeopathic Medical College, 1894 formerly health officer of Kingston and town of Ulster, district state health officer, served during the World War, formerly medical director and superintendent of the Ulster County Tuberculosis Hospital, Kingston, aged 65, died, Nov 23, 1937, of uremia and chronic myocarditis

**Arthur Clayton Sinton Jr** ☉ Richmond, Va, Medical College of Virginia, Richmond, 1914 associate professor of gynecology at his alma mater, fellow of the American College of Surgeons, associate surgeon, Memorial and St Philip hospitals, visiting surgeon, Retreat Hospital, served during the World War, aged 47, died, Nov 7, 1937 of angina pectoris

**David R Wilkins**, Pocahontas, Ill, Missouri Medical College, St Louis, 1878, past president of the Bond County Medical Society, formerly mayor of Pocahontas and school treasurer of Burgess township for many years secretary of the Board of U S Examiners for Bond County, aged 82, died, Nov 22, 1937, of arteriosclerosis and arthritis

**Alpheus Leslie Sharber**, Nashville Tenn University of Tennessee Medical Department, Nashville, 1904, fellow of the American College of Surgeons, served during the World War, formerly professor of surgical anatomy and visceral anatomy, Universities of Nashville and Tennessee Medical Department, aged 59, died, Nov 30, 1937

**Guy Howard Reed** ☉ Beaumont, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1898, past president of the Jefferson County Medical Society, on the staffs of the Hotel Dieu Hospital and St Therese Hospital aged 61, died, Nov 2, 1937, of hypertension and arteriosclerosis

**William Caldwell Crocket**, Fredericton, N B, Canada, McGill University Faculty of Medicine, Montreal 1886, L R C P, London, England, 1886 formerly mayor of Fredericton, chairman of the board of health of Fredericton and member of the legislature of New Brunswick, aged 77 died, Nov 15, 1937

**Thomas A Stoddard**, Pueblo Colo University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886, member of the Colorado State Medical Society fellow of the American College of Surgeons, on the staff of St Mary Hospital, served during the World War, aged 80, died Nov 19, 1937

**Winfred J Wright** ☉ Skippack, Pa Medico-Chirurgical College of Philadelphia, 1902, past president of the Montgomery County Medical Society, secretary of the board of education of Skippack, president of the staff of the Riverview Hospital Norristown, aged 61, died, Nov 15, 1937, of pulmonary embolism

**James Fletcher Jarvis**, Sweet Springs Mo University of Louisville (Ky) Medical Department 1879 Jefferson Medical College of Philadelphia, 1891 member of the Missouri State Medical Association aged 81 died Nov 8 1937, of pernicious anemia and cerebral thrombosis

**Edgar Calvin Seibert**, Orange, N J, Columbia University College of Physicians and Surgeons, New York, 1896, past president of the city board of education, aged 65, formerly on the staff of St Mary's Hospital, where he died, Nov 7, 1937, of intestinal obstruction

**Dirk John Werkman**, Cedar Rapids, Iowa, University of Michigan Department of Medicine and Surgery, Ann Arbor 1892, formerly mayor of Hull, for many years instructor in chemistry department, Coe College, aged 70, died, Nov 24 1937, of heart disease

**William Andrew McMahan**, Union, Miss, St Louis College of Physicians and Surgeons, 1908, member of the Mississippi State Medical Association, county health officer, aged 54 died, Nov 15, 1937, in Philadelphia, of chronic nephritis and hypertension

**George Burgess Whitney** ☉ Haverhill, Mass, Medical School of Maine, Portland, 1908, formerly member of the school committee, on the staff of the Haverhill Municipal Hospital, aged 56, died, Nov 19, 1937, in the New England Baptist Hospital, Boston

**Barnet Edward Bonar** ☉ Salt Lake City, Rush Medical College, Chicago, 1919, member of the American Pediatric Society and the American Academy of Pediatrics, aged 43, was instantly killed, Dec 18, 1937, when he fell from a window

**Fred Campbell Turley**, Alton, Ill, Vanderbilt University School of Medicine, Nashville, Tenn, 1931, formerly a first lieutenant in the U S Army, on the staff of St Louis Children's Hospital, aged 30, was found dead in bed, Nov 5, 1937

**Jacob Franklin Trexler**, Lancaster, Pa, Jefferson Medical College of Philadelphia, 1894, member of the Medical Society of the State of Pennsylvania, for many years deputy coroner, aged 74, died, Nov 7, 1937, of carcinoma of the stomach

**George Luther Zimmerman**, Carlisle, Pa, Jefferson Medical College of Philadelphia, 1889, member of the Medical Society of the State of Pennsylvania, on the staff of the Carlisle Hospital, aged 75, died, Nov 21, 1937, of myocarditis

**George Edwards Staub**, New Milford, Conn, Long Island College Hospital, Brooklyn, 1893, member of the Connecticut State Medical Society, aged 68, died, Nov 24, 1937, in the Stamford Hospital, of adenocarcinoma of the ileum

**John Randolph Sherman**, Phil Campbell, Ala, Chattanooga (Tenn) Medical College, 1897, member of the Medical Association of the State of Alabama, aged 65, died, Nov 8, 1937, of arteriosclerosis and chronic heart disease

**Chester C Sloan** ☉ Moline, Ill, University of Pennsylvania Department of Medicine, Philadelphia, 1904, on the staffs of the Lutheran Hospital and Moline Public Hospital, aged 60, died, Nov 17, 1937, of heart disease

**Walter Chadwick Sears**, Chicago, University of Vermont College of Medicine, Burlington, 1899, member of the Rhode Island Medical Society, aged 68, died, Nov 5, 1937, in Evans ton, Ill, of carcinoma of the stomach

**Thomas Edward Stafford**, Vossburg, Miss, Tulane University of Louisiana Medical Department, New Orleans, 1901 member of the Mississippi State Medical Association, aged 65, died in November, of angina pectoris

**James W Mott**, Poplar Bluff, Mo, University of Louisville (Ky) Medical Department, 1886, member of the Missouri State Medical Association, aged 74, died, Nov 15, 1937, in Los Angeles, of bronchopneumonia

**William Alexander Monroe** ☉ Tacoma, Wash, University of Oregon Medical School, Portland, 1906, past president of the Pierce County Medical Society, served during the World War aged 57, died, Oct 11, 1937

**Frederick A Whitaker**, Kingston, N C, University of Pennsylvania Department of Medicine, Philadelphia, 1875, aged 87 died, Nov 2 1937, in the Memorial General Hospital, of chronic myocarditis and nephritis

**Kivy I Pearlstone** ☉ Charleston, S C, University of Maryland School of Medicine Baltimore, 1906, aged 53, on the staff of the Riverside Infirmary, where he died, Nov 2, 1937 of coronary thrombosis

**Thomas Ignatius Shannon**, Norwich, Conn, Baltimore University School of Medicine 1899 member of the Connecticut State Medical Society aged 63, died, Nov 30, 1937, of diverticulitis and myocarditis

**William Earnshaw Styan** ☉ San Francisco, College of Physicians and Surgeons of San Francisco, 1906, aged 63, died Nov 24 1937, in the United States Marine Hospital, of adenocarcinoma of the rectum

**James Sam Taylor**, Clinton, Tenn., Tennessee Medical College, Knoxville, 1902 member of the Tennessee State Medical Association, aged 59, died, Nov. 24, 1937, of streptococcal infection of the throat

**John Thomas Rees**, Yerington, Nev., Kansas City (Mo.) Medical College, 1894, formerly in the Indian Service, served during the World War, aged 71, was killed, Nov. 3, 1937, in an automobile accident

**Edward Dennis Phelan**, Newark, N. J., McGill University Faculty of Medicine, Montreal, Que., Canada, 1892, aged 66, died, Nov. 28, 1937, in a local hospital, of bronchopneumonia and diabetes mellitus

**Tunison T. Rosendale**, Fostoria, Ohio, Western Reserve University Medical Department, Cleveland, 1893, formerly member of the city council, aged 66, died, Nov. 22, 1937, of granulocytopenia

**Robert Edmund Lau**, York, Pa., Jefferson Medical College of Philadelphia, 1909, member of the Medical Society of the State of Pennsylvania, aged 54, died, Nov. 13, 1937, of coronary thrombosis

**George C. Thompson**, Kansas City, Mo., University Medical College of Kansas City, 1899, aged 69, died in November 1937, of skull fracture and internal hemorrhage due to an automobile accident

**Samuel Forbes McComb**, Pittsburgh, Jefferson Medical College of Philadelphia, 1879, member of the Medical Society of the State of Pennsylvania, aged 85, died, Nov. 12, 1937, of arteriosclerosis

**Frank J. Taraba**, Chicago, College of Medicine and Surgery, Chicago, 1910, on the staffs of the Edgewater and American hospitals, aged 53, died, Nov. 22, 1937, of cerebral embolism

**Will P. Bradley**, Windsor, Mo., Barnes Medical College, St. Louis, 1898 member of the Missouri State Medical Association, aged 68, died, Nov. 1, 1937, of carcinoma of the sigmoid

**George W. Willeford**, Indianapolis, Chicago Medical College, 1874, past president of the Daviess County Medical Society, aged 90, died, Nov. 14, 1937, of cardiovascular renal disease

**Christen Jensen Christensen**, Jewell, Iowa, State University of Iowa College of Medicine, Iowa City, 1902, aged 63, died, Nov. 8, 1937, in a hospital at Webster City, of pneumonia

**Robert Warren Smart**, Aurora, Mo., Barnes Medical College, St. Louis, 1901, served during the World War, aged 60, died, Nov. 10, 1937, of chronic myocarditis and hypertension

**Charles Edward Robinson**, Little Rock, Ark., Jefferson Medical College of Philadelphia, 1880, aged 84, died, Nov. 16, 1937, in the Baptist Hospital, of uremia and chronic nephritis

**Gilbert Taylor Abernathy**, Paris, Tenn., Vanderbilt University School of Medicine, Nashville, 1887, aged 78, died, Dec. 27, 1937, of injuries received when struck by an automobile

**Edgar Douglass Lamy**, Stamford, Conn., New York Homeopathic Medical College and Flower Hospital, New York, 1912, aged 54, died, Nov. 23, 1937, of coronary thrombosis

**William McKimmie Higgins**, West Haven, Conn., Yale University Medical School, New Haven, 1902, aged 68, died, Nov. 4, 1937, of carcinoma of the bronchus with metastasis

**Jane Conger Davis**, New York, New York Medical College and Hospital for Women, New York, 1895, aged 76, died, Nov. 1, 1937, of myocarditis and chronic nephritis

**John William Padberg**, Choctaw, Okla., College of Physicians and Surgeons, Dallas, Texas, 1906, aged 67, was found dead Nov. 15, 1937, of a self-inflicted bullet wound

**Zacheus La Fayette Kay**, McCook, Neb., Kentucky School of Medicine, Louisville, 1876, formerly health officer of McCook, aged 83, died Nov. 12, 1937, of carcinoma of the rectum

**Wilbur Fisk Yarbrough**, Miccosukee, Fla., Atlanta Medical College, 1887, formerly member of the county board of education, aged 71, died, Nov. 9, 1937, of chronic bronchitis

**Harlen Arthur Todd**, Visalia, Calif., College of Physicians and Surgeons of San Francisco, 1914, served during the World War, aged 54, died, Nov. 8, 1937, of cerebral anemia

**Charles H. Waxham**, Sugar City, Colo., College of Physicians and Surgeons of Chicago, 1893, aged 76, died, Nov. 23, 1937, of dilatation of the heart and diabetes mellitus

**Thomas Jefferson Lambert**, Aurora, Ill., Jenner Medical College, Chicago, 1906, member of the Illinois State Medical Society, aged 68, died, Nov. 13, 1937, of heart disease.

**Charles Lee Buchanan**, Union Mills, N. C., University of Tennessee Medical Department, Nashville, 1910, aged 67, died, Nov. 19, 1937, of chronic nephritis and endocarditis

**William Henry Weber**, Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1894, aged 72, died, Nov. 19, 1937, in St. Joseph's Hospital, of intestinal obstruction

**George Welcome Reynolds**, Mayville, N. Y., University of Buffalo School of Medicine, 1907, aged 63, died, Nov. 16, 1937, of cerebral hemorrhage and arteriosclerosis

**A. W. Tobias**, Elwood, Ind., Hospital College of Medicine, Louisville, Ky., 1892, Louisville Medical College, 1893, aged 75, died, Nov. 12, 1937, of cerebral hemorrhage

**Thomas Tipton Walker**, Waverly, Mass., Harvard University Medical School, Boston, 1929, aged 33, died, Nov. 13, 1937, in Boston, of poison, self administered

**Seabury Wells Allen**, Boston, Harvard University Medical School, Boston, 1897, aged 67, died, Dec. 20, 1937, at Kittery Point, Maine, of coronary thrombosis

**Reinhold Passler**, St. Louis, Marion-Sims College of Medicine, St. Louis, 1892, aged 75, died, Nov. 27, 1937, of septic myocarditis following pyonephritis

**Carl Sherman Bishop**, Fairfield, Iowa, Keokuk Medical College, 1894, aged 73, died, Nov. 21, 1937, in a hospital at Ottumwa, of carcinoma of the prostate

**Albert P. Heald**, Thomaston, Maine, University of Vermont College of Medicine, Burlington, 1884, aged 76, died, Nov. 2, 1937, of cerebral thrombosis

**Edward L. Toomer**, Fitzgerald, Ga., Meharry Medical College, Nashville, Tenn., 1908, aged 55, Nov. 2, 1937, of cerebral hemorrhage and uremia

**Albert Lee Monroe**, Newton, Miss., Memphis (Tenn.) Hospital Medical College, 1898, aged 63, died, Nov. 11, 1937, of coronary thrombosis

**Earl Z. Bacon**, Sharon, Pa., Hahnemann Medical College and Hospital, Chicago, 1885, aged 94, died, Nov. 25, 1937, of coronary thrombosis

**Oliver B. McKinney**, George, Iowa, Medical College of Indiana, Indianapolis, 1885, aged 74, died, Nov. 1, 1937, of chronic myocarditis

**David Finis Gaston**, Gastonburg, Ala., University of Louisiana Medical Department, New Orleans, 1882, aged 77, died, Nov. 4, 1937

**John Clark McCracken**, Smithfield, Pa., Long Island College Hospital, Brooklyn, 1880, aged 82, died, Nov. 3, 1937, of heart disease

**Edwin Dixon Carder**, Vancouver, B. C., Canada, University of Toronto Faculty of Medicine, 1900, aged 62, died, Oct. 31, 1937

**N. Yancey Alford**, Wisacky, S. C., Medical College of the State of South Carolina, Charleston, 1884, aged 75, died, Nov. 6, 1937

**Cecil Kirke Russell**, Falfurrias, Texas, Rush Medical College, Chicago, 1921, aged 42, died, Nov. 16, 1937, of coronary artery disease

**Eugene Van Slyke**, Albany, N. Y., Albany (N. Y.) Medical College, 1871, aged 86, died, Nov. 8, 1937, of cerebral thrombosis

**John William Spillman**, Amsterdam, Ohio, Baltimore Medical College, 1905, aged 59, died, Nov. 17, 1937, of angina pectoris

**Walter P. Havens**, Farmingdale, N. J., Baltimore Medical College, 1904, aged 56, died, Nov. 14, 1937, of pulmonary tuberculosis

**James William Frazier**, Honey Creek, Iowa, Omaha Medical College, 1887, aged 77, died, Nov. 21, 1937, of pneumonia

**Thomas C. Blackburn**, Hickory, N. C., Baltimore Medical College, 1896, aged 68, died, Nov. 29, 1937, of myocarditis

**John Block**, New York, New York University Medical College, New York, 1897, aged 65, died, Oct. 29, 1937

**W. M. Matthews**, Polk City, Fla., Hospital Medical College, Atlanta, Ga., 1909, aged 50, died, Nov. 5, 1937

**Henry M. Lint**, St. Joseph, Mo., Central Medical College of St. Joseph, 1905, aged 74, died, Nov. 20, 1937

**James Edward Johnson**, Cincinnati, Rush Medical College, Chicago, 1897, aged 65, died, Nov. 25, 1937

**Asa N. Jones**, Walton, Ky., Medical College of Ohio, Cincinnati, 1881, aged 82, died, Nov. 3, 1937

## Bureau of Investigation

### THE PEDODYNE FOOT BUSINESS

#### George J Katz Avoids the Issuance of a Post Office Fraud Order

Nearly a decade ago (Aug 11, 1928) the Bureau of Investigation of the American Medical Association published in this department of THE JOURNAL an article entitled "Pedodyne for Bunions, The Mail-Order Quackery of the Hypothetical George J Kay" Nearly nine years later (April 1937) the concern was about to be denied the use of the United States mails but, "with a view of preventing at that time the issuance of a fraud-order" against it, the promoter of the business agreed to discontinue and abandon it

The article published in 1928 brought out that one George J Katz of Chicago was behind the Pedodyne business It called attention to the further fact that some years previously a man of the same name was engaged in some other disreputable and indecent medical mail-order quackery and had been indicted by a federal grand jury on the charge of operating a fraudulent mail-order concern Moreover, the article emphasized that nowhere in the Pedodyne advertising and circular letters did the name of George J Katz appear but, instead, that the circulars and follow-up material were signed "George J Kay"

THE JOURNAL article stated that while the Katz outfit put out a number of products ('Corn Remover,' "Chilblain

false claims in its advertising The commission declared that its investigations showed that Pedodyne "will not banish, cure or heal bunions" and it stated that the respondents in the Pedodyne Company were George J Katz, Rose M Katz and "Robert L Keats," also known as "Robert J Katz"

This fakery was in operation for over thirteen years without any let or hindrance from municipal, state or federal authorities No doubt Katz feels that the government gave the concern a good run for its money!

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST

### CHILDBIRTH AS CAUSE OF DEATH—NEPHRITIS AND ABORTION—ABORTION AND GYNE COLOGIC DISEASE

To the Editor—Recently I read the following published statements and wish to confirm them and if possible learn the authority for each 1 Next to tuberculosis, childbirth ranks first as the cause of death in women between the ages of 15 and 44 years of age 2 Next to syphilis nephritis is the most common cause of abortion (premature labor) 3 Pregnancy is interrupted in one third of all cases complicated by clinically evident pyelonephritis 4 From 50 to 60 per cent of all gynecologic patients date the onset of their illness from an abortion (premature labor) If these statements are incorrect will you please give me a correct estimate of the points involved

M D Missouri

ANSWER—1 The chief causes of death in women between 15 and 44 years of age in the order of their frequency are tuberculosis, diseases of the heart, puerperal causes, malignant disease, pneumonia and nephritis Hence childbirth ranks third as a cause of death This information may be verified in the Philadelphia County Medical Society report on "Maternal Mortality in Philadelphia 1931-1933" and also in "Mortality Statistics of 1934," published by the United States Government Printing Office in February 1937

2 This is true (See De Lee's "Principles and Practice of Obstetrics," ed 6, p 459)

3 This also is true (See G H Dodds on "The Immediate and Remote Prognosis of Pyelitis of Pregnancy and the Puerperium," J Obst & Gynaec Brit Emp 39 46, 1932)

4 This is not true Perhaps this statement is confused with the one which maintains that between 50 and 60 per cent of gynecologic ailments may be traced back to childbirth The latter statement is most likely correct

### ADRENOCORTICAL SYNDROME FROM TUMOR IN CHILD

To the Editor—A girl aged 3 years, had a tumor in the left kidney region Operation revealed a carcinoma of the left adrenal gland The symptoms were hirsutism rapid growth and a masculine voice How many cases have been reported? What is the frequency?

M D Pennsylvania

ANSWER—The patient apparently had a hyperfunctioning adrenal cortical tumor resulting in a condition known as the "adrenocortical syndrome"

Tumors of the adrenal cortex are indeed rare among children Kepler, after a careful search of the literature, was able to find reports of only twenty-six cases of this disease affecting female children, including the cases observed by him Hyperfunctioning adrenal cortical tumors are even less frequently found among male children Although this condition most frequently afflicts adult females, probably less than 100 cases have been reported in the literature

The symptoms produced by tumors of the adrenal cortex vary, depending on the age and sex of the patient, the duration of the disease and the nature of the pathologic process In some cases the tumors are found to be rapidly growing, highly malignant neoplasms that metastasize early, others are relatively benign Authentic cases of adrenal cortical tumor have been reported in which there have been few, if any, apparent endocrine changes

When the disease afflicts a female before birth, in early infancy or before puberty the syndrome is very similar to that of pseudohermaphroditism The predominating clinical feature of the syndrome is the change toward masculinity Hair

NEW YORK, N.Y.
CHICAGO, ILLINOIS
LOS ANGELES, CAL.

### Kay Laboratories

**PEDODYNE**  
for Bunions

160 NORTH WACKER DRIVE, CHICAGO, ILL.  
All orders, by mail and correspondence, should be addressed to the Chicago Laboratory  
CANADIAN LABORATORIES: 25 SHEPPARD ST. E., WINDSOR, ONT.

RECOMMEND  
For Bunions  
RECOMMEND  
Corn Remover  
RECOMMEND  
Mail and Shoe Corners  
and Calluses  
RECOMMEND  
Chilblain Remedy

RECOMMEND  
For Baby Corns  
RECOMMEND  
For Baby Corns  
RECOMMEND  
For Baby Corns  
RECOMMEND  
For Baby Corns

Take Advantage of  
This Five Day Offer  
Dear Friends:

Es 1931

"You have a FIVE DAYS to take advantage of this special introductory offer."

Remedy," "Foot Bath Comfort," "Foot Powders") the 'Pedodyne for Bunions' was the preparation that Katz pushed hardest It was claimed for the bunion "cure" that it would "dissolve" bunions, that it was a "miracle of chemistry" and that it represented "years of study and experimentation"—three definite falsehoods

The A M A Chemical Laboratory was asked to analyze "Pedodyne for Bunions," which it did and reported that the "cure" consisted of three parts (1) an ointment, (2) a powder and (3) a number of small squares of paper The chemists reported that the ointment had an animal-fat base in which were incorporated phenol (carbolic acid) and salicylic acid, iodine and small amounts of camphor and menthol The powder was mainly boric acid, borax and talc with small amounts of alum, zinc oxide and salicylic acid

And this humbug was sold under such claims as

Pedodyne contains the elements that a sore swollen bunion afflicted skin seems to crave It enables the pores to throw off the pus and other poisonous accumulations

Pedodyne will positively astonish you just as it has thousands of other sufferers It is NEW It is DIFFERENT It is SCIENTIFIC

Pedodyne is recognized as the MOST sane and sensible treatment ever devised for bunion troubles

All these facts were detailed in THE JOURNAL Aug 11, 1928, but Katz continued to do business! Then in March 1937 the Post Office department issued a citation calling on the Pedodyne concern and George J Katz to show cause why a fraud order should not be issued But in order to forestall such an order Katz executed an affidavit on April 19, 1937 in which he agreed to discontinue the business As a result the postmaster at Chicago was directed to return to the senders all mail received at that office addressed to Pedodyne Company, Inc "Pedodyne Company" and 'George J Kay'

About the same time (April 24 1937) the Federal Trade Commission issued a 'cease and desist order' in which the Pedodyne Company, Inc, was ordered to cease making certain



appears on the genitals, followed by growth on the face, body and extremities. There is hypertrophy of the external genitalia, particularly the clitoris and labia majora. The voice becomes deep and coarse. The vocal cords are generally increased in size. The skin becomes coarse, dry and reddened. Acne is frequently present. Obesity is seen in the majority of cases, with a round fat face and considerable adipose tissue about the trunk. Macular hypertrophy is noted at times while, on the other hand, the patient may be cachectic. In some cases bodily growth may be rapid and ossification of the epiphyses premature. Enlargement of the breasts has been reported, this, however, is not the rule. Generally the child is mentally precocious. However, the reverse is occasionally noted. Vaginal and presumably uterine bleeding has been noted. This is unusual, however, for the patients rarely menstruate, even though the age of puberty has been reached. Hypertension is thought to occur probably more frequently than it has been noted. Reduced carbohydrate tolerance and frank glycosuria have been reported. There is no constant psychic change. As has been stated previously, these symptoms may not all be present and, when they are present, considerable variation in their intensity may occur in different cases.

The differential diagnosis is at times extremely difficult if not impossible to make. The condition of hyperfunctioning tumor of the adrenal cortex must be distinguished from pituitary basophilism, bilateral adrenal cortical hyperplasia with or without thymoma and arrhenoblastoma of the ovary. Occasionally intracranial lesions, including tumors of the pineal body and contiguous structures, may produce a similar picture.

If a definite diagnosis of adrenal tumor can be verified, an attempt should be made to remove the tumor surgically. In the past the operative mortality has been extremely high. Death generally results from acute adrenal insufficiency and shock. With the aid of recent knowledge in controlling acute adrenal insufficiency, the hazard from this cause has been markedly reduced. Results have been pleasing in patients who have survived the operation, for if recurrence or metastasis does not take place the patient generally can anticipate almost complete symptomatic relief. Traces of the anatomic changes may remain.

#### SPINAL FLUID WASSERMANN TEST

*To the Editor*—In two cases diagnosed clinically as dementia paralytica the laboratory report on the Wassermann test of the spinal fluid was negative in 1:0.5 and 0:2 cc. The presence of occult blood precluded the running of a Ross Jones Pandy cell count and a colloidal gold test. Within two weeks on repetition of the tests without therapy having been instituted both spinal Wassermann tests were reported as being 4 plus in 0:1.05 and 0:2 cc. The other tests on the spinal fluid confirmed the presence of a syphilitic infection. What is the possible explanation for the reversal of the spinal fluid Wassermann reaction from negative to positive?

M D Illinois

*ANSWER*—In reliable serologic laboratories, complement fixation tests for syphilis on spinal fluid are performed with an amount of fluid ranging from 0.1 to 1 cc. The probable reason for variation in tests within two weeks on patients clinically recognizable as having dementia paralytica is almost certainly that the laboratory is unreliable.

#### INTRAVENOUS SODIUM THIOSULFATE IN RINGWORM

*To the Editor*—Is sodium thiosulfate of any value in ringworm infections when used intravenously? I found reference to its being used as a topical application but none for its intravenous use and I have used it in four or five cases chiefly ringworm of the beard. In all of these the infection cleared up more rapidly than with anything else. I gave two treatments to each patient about two days apart and no more were needed. I should add that the diagnosis was clinical rather than microscopic. Were these accidents or is there some rational basis for its use?

L A MILLER M D North English Iowa

*ANSWER*—No reference to the use of intravenous injections of sodium thiosulfate for ringworm of the beard has been found. It is not likely that the drug acts specifically against ringworm. More probably it exerts a nonspecific, alterative effect, similar to that by which it benefits arsenphenamine dermatitis and some cases of eczema. There are several theories attempting to explain its action.

E F Muller and Müller and Delbanco to explain the benefit produced by sodium thiosulfate in arsenphenamine dermatitis, suggest that it may act by regulating the disturbed vagosympathetic balance (quoted from Perutz, *A Handb d Haut u Geschlechtskr*, Berlin, Julius Springer 1936).

Kabelik (Indications for and Value of Sodium Thiosulfate, *Praxis med* 41 1315 [Aug 23] 1933) thinks that sodium thio-

sulfate stimulates the reticulo-endothelial system and speeds up phagocytosis and that it frees colloidal sulfur in a weakly acid medium. Thus it may assist the sulfur metabolism of the epidermis, which is so important to the formation of healthy keratin. He also emphasizes its action on the colloid of the blood, as the means by which it exercises an antianaphylactic effect.

Sodium thiosulfate has shown itself helpful in many skin diseases, various forms of poisoning and several internal diseases and it is not difficult to believe that it may be of benefit in the deep fungous infections typified by ringworm of the beard. Further investigation and a report of the results, with a careful explanation of the method of arriving at the diagnosis and details of other forms of treatment used with the intravenous injections, are indicated.

#### DISABILITY FROM FRACTURE OF LUMBAR VERTEBRAE

*To the Editor*—A patient had a fracture of the fourth and fifth lumbar vertebrae about a year and half ago which has ankylosed. The alignment lateral and anteroposteriorly is good and there is no noticeable deformity. I cannot detect any motor or sensory symptoms in the lower limbs. I am anxious to know what disability, if any in percent age would be fair in a case of this kind.

M D Kansas

*ANSWER*—A patient with a fracture of the lumbar vertebral bodies, without cord involvement, and final recovery to the extent of useful strength, free motion, no muscle spasm or pain up to 75 per cent normal is entitled to 19.5 per cent total disability, according to McBride's disability evaluation, in lesions of the cauda equina with only partial incontinence, 16.5 per cent of total disability (McBride, E D Disability Evaluation Principles of Treatment of Compensable Injuries, Philadelphia, London and Montreal, J B Lippincott Company, 1936, p 518). If paralysis occurs from lesions of the cauda equina, the loss is based on the extent of paralysis, i e, whether of one or of both legs.

#### PROGRESSIVE MUSCULAR ATROPHY

*To the Editor*—A man aged 60 has had a typical progressive spinal muscular atrophy for about thirty years. He has no difficulties in walking but is entirely unable to step up even the lowest step without being helped. When it comes to stepping up a little higher step the patient has to be lifted up by his buttocks. The Wassermann reaction has always been negative. There has never been a similar case in the ancestors. He has had all kinds of treatment the last one having consisted of aminoacetic acid and liver and prostigmin injections. Does treatment at warm springs have a beneficial effect on conditions similar to this? Of what does the treatment consist?

M D New York

*ANSWER*—If a patient with progressive muscular atrophy of thirty years' duration is nonsyphilitic and his condition is not due to lead poisoning, there is no treatment that will affect the course of the disease. The treatment at "warm springs" by exercises in water is useful only in conditions of a nonprogressive nature, particularly poliomyelitis.

#### CIVATTE'S POIKILODERMA OR RIEHL'S MELANOSIS

*To the Editor*—Is there any possibility of obtaining satisfactory therapeutic results with venon therapy in the treatment of poikiloderma reticulare pigmentaire du visage et du cou (Civatte)? A man has an eruption on the forehead on each side but not in the central line also over the nuchal area. The eruption is essentially superficial is not infiltrated and is characterized by cayenne pepper like red spots with minute areas of atrophy separating them. The diagnosis is difficult to make but it seems to conform to Civatte's disease.

M D Massachusetts

*ANSWER*—Civatte's poikiloderma is now held to be synonymous with Riehl's melanosis. The disorder is probably due to toxic impurities in fat substitutes, such as mineral oils. Snake venom is not apt to be of any benefit in this disorder, particularly after the stage of atrophy has been reached.

#### DISCIFORM KERATITIS

*To the Editor*—Is there any treatment of value for keratitis disciformis not caused by herpes? Is silver arsenphenamine salyrgan or mercurials of any value?

A T MILLER M D Kalamazoo Mich

*ANSWER*—Disciform keratitis is resistant to local treatment. Deep heat in the form of infra-red lamps or diathermy is probably of some value, as is roentgen therapy. Two 35 per cent skin doses of x-rays carefully measured may be of value. General fever therapy may also be of value during the acute stages. The arsenicals and mercurials are not supposed to be of any value. After the acute stage is over the use of ethylmorphine hydrochloride and massage of the cornea with zinc oxide ointment probably aids in clearing the scar.

## ACUTE RECURRENT IRITIS

*To the Editor*—A white man aged 28 single and of excellent habits has recurring attacks of iritis about every nine months. His general physical examination is negative. The blood pressure is 125 systolic and 85 diastolic the urine is normal the red blood cell count is 4 800 000 and hemoglobin is 90 per cent. The Wassermann reaction of the blood and the spinal fluid is negative. There is no evidence of sinus infection or middle ear disease. The gallbladder has given no symptoms but no tests have been made to determine whether any pathologic condition exists. The tonsils were removed four years ago. Fluid expressed by prostatic massage shows a normal cell count under the microscope. Treatment with salicylates parenteral injections of milk and calcium intravenously and local treatment are not effective. There is a diminution of vision after each attack so that at present he has 20/30 in the right eye and 20/50 in the left eye. At present he is free from iritis but is apprehensive that another attack is due as the attacks seem to come about every nine months. Can you offer any suggestions that might prevent the recurrence of these attacks?

M D, California

*ANSWER*—No cause can be found in about one in five cases of acute recurrent bilateral iritis, such as described. However, positive observations sometimes follow negative ones, as when gonococci are first found in prostatic strippings on a second or third examination. No eye doctor and no general practitioner can be as competent as an internist with a real 'detective sense' and he should be the final resort.

## FOLLICULITIS OF FACE

*To the Editor*—A Negro aged 23 has been troubled with a folliculitis for eighteen months. The disease is confined entirely to the bearded area and is most severe about twenty four hours after shaving. I have used several of the usual skin lotions for folliculitis have tried having the patient go without shaving for a week at a time and have tried gradually increasing dosages of ultraviolet therapy all with little or no improvement. General physical examination is essentially negative except for a mild acne vulgaris of the back and shoulders. X rays or electrolysis have been considered as therapeutic measures but I should prefer not utilizing these measures. Any information relative to the therapy of this case and especially a discussion of X rays and electrolysis in similar cases will be appreciated.

M D District of Columbia

*ANSWER*—The patient evidently has a stubborn folliculitis. He might try bathing the affected areas night and morning with a saturated solution of boric acid or a weak mercury bichloride solution. This should be followed at night byunction of a 3 to 5 per cent ammoniated mercury ointment and in the day time with a dusting powder of calomel four parts, boric acid four parts, and sufficient talcum to make thirty parts. X-rays and electrolysis are not advocated in this type of case.

## BRONCHOPNEUMONIA WITH B PYOCYANEUS

*To the Editor*—A man aged 35 for the last six weeks has had a bronchial pneumonia due to *Bacillus pyocyaneus*. Pure cultures of *Bacillus pyocyaneus* have been found consistently. His Wassermann reaction is negative. He does not have undulant fever. The urine is normal and the Widal test is negative. Two X-ray studies have shown a bronchial pneumonia of the left lower base. The apexes are relatively clear. The sputum has been persistently negative to search for tubercle bacilli and other organisms. His blood count was normal except for a leukocytosis of 20 000 and an increase in the polymorphonuclears. Is there any specific therapy either medicinal vaccine or serum therapy for this type of disease? The man has a slight fever every evening about 5 or 6 o'clock otherwise his temperature is normal and he does not feel ill.

CHRISTEN QUEVLI JR M D Tacoma Wash

*ANSWER*—There are no specific serums in use for pyocyanus infections. An autogenous vaccine could be made, but in the first place the finding of pyocyanus organisms does not necessarily mean that they cause the disease and in the second place the efficacy of such a vaccine is questionable.

## TREPANING IN OSTEITIS DEFORMANS OF SKULL

*To the Editor*—A patient with osteitis deformans of the cranium who has severe and agonizing pain on laughing sneezing and coughing has been offered trepaning as relief for the attacks. Please elaborate on the results of the operation.

A I BROADWATER M D Oakland Md

*ANSWER*—It is assumed that the patient suffers pain in the head on laughing, sneezing and coughing. This in a patient with osteitis deformans of the cranium may be due to a decrease in the available intracranial space brought about by the bony deformity but it might also be brought about by a concurrent neurologic lesion, which should not be overlooked. To obtain relief by some simple procedure such as trepaning the preferable surgical treatment would be to perform a right sided subtemporal decompression, which would entail the removal of the squamous portion of the temporal bone and a stellate opening in the dura mater to correspond with the area of bone removal. This opening, over a relatively silent area, would

allow expansion of the brain and consequent relief from the pain brought on by the pressure produced when, on straining the intracranial contents are increased in volume. Properly performed, this operation would not result in harm to the patient.

## DETERMINATION OF FORMIC ACID IN BLOOD AND URINE

*To the Editor*—Is there a test which I can use in my office to detect the presence of formic acid in the secretions of the rectum and anus? If there is such a test, I will appreciate very much information and technic concerning it.

F M POSTLETHWAITE M D Kansas City Mo.

*ANSWER*—A method for the determination of formic acid in blood and urine is described in the *Journal of Laboratory and Clinical Medicine* 10 59 (Oct) 1924. It is possible that this method may be applied to mucous secretions if sufficient material is obtainable.

## HONEY IN DIABETES

*To the Editor*—Is honey harmful in diabetic condition?

M D, Onaway Mich.

*ANSWER*—Honey is simply a solution of carbohydrate of highly sweetening power and is as harmful or helpful to a diabetic patient as other similar solutions of carbohydrate. Its composition is variable, but the sugar is chiefly monosaccharids. Honey contains approximately 74 per cent of carbohydrate and this is about equally divided between levulose and dextrose. Occasionally the proportion of levulose is somewhat greater and this depends on the source of the carbohydrate available to the bees. For practical purposes levulose, contrary to folklore and early experimental work, is utilized no better than dextrose. It may be changed into dextrose in the liver and stored as glycogen and it is possible that it may be converted into fat more readily than dextrose.

## BRONCHIAL TUBES 'BLOWN'

*To the Editor*—One of my asthmatic patients has requested that I have her bronchial tubes 'blown'. She states that a friend of hers was cured of asthma by such treatment. A review of the literature at hand fails to enlighten me on the technic or the efficacy of such a procedure. Will you please furnish me with information on this subject?

J EVERARD CAREY M D New York.

*ANSWER*—It is not clear what the patient may mean by having her bronchial tubes "blown" for asthma. Possibly she may refer to instillation of iodized oil into the bronchi. This is a well known procedure which has given temporary relief in some cases of asthma with bronchiectasis. The patient, however, may mean the use of a 1:100 solution of epinephrine by inhalation through the use of a nebulizer. This procedure was recommended by Rowe and Graesser in 1935 and has been useful for the relief of relatively mild attacks of asthma. Neither one of these methods, however, can in any sense be considered a cure for the condition.

## CALCIUM CHLORIDE ORALLY

*To the Editor*—Would there be any ill effects from prescribing from 15 to 20 grains (1 to 1.3 Gm) of calcium chloride in a glassful of water after each meal three times a day to an adult the patient having no untoward symptoms to contraindicate its use?

EARL L VERNON M D Chicago

*ANSWER*—Calcium chloride is an irritant, as are most of the soluble calcium compounds. Oral administration of large doses of calcium chloride increases the acidity of the urine. A less soluble compound for the purpose of calcium administration would probably be preferable if the medicament is simply to increase the calcium content of the blood. Calcium chloride is best administered in a solution sweetened with syrup or elixir. Solutions of calcium gluconate and lactate are less irritating than those of chloride, although they too in large doses may be the cause of diarrhea. There is less difference in the chloride and the lactate when the product is administered orally than otherwise.

## CAN A THROMBUS BE DISSOLVED?

*To the Editor*—Have there been any attempts to dissolve a thrombus?

M D New York

*ANSWER*—No references to successful attempts to dissolve thrombi *in vivo* have been found and several clinicians interested particularly in thrombosis in blood vessels, pharmacologists and physiologists have not been able to give information of a positive nature on this subject.

This volume makes its second appearance three years after the original publication. Revisions and additions to the text bring it in line with the most recent ideas in the field of fractures. The authors recognize the growing importance of fractures in a society which is becoming more and more industrialized. They feel that not all fractures in the future will be treated by the specialist and that therefore the general practitioner should be able to recognize the possible occurrence of complications and deformities in certain fractures. This large volume, containing numerous drawings and reproductions of roentgenograms, covers the field in all its aspects. The treatise is preeminently practical, with emphasis on treatment. It is as nearly complete and adequate as any one single volume could be. Recognizing the value of specialization in their own already specialized field, the authors leave the subject of fractures of the skull and fractures of the jaws and the face to be treated by Dr. Charles E. Dowman and James Barrett Brown, respectively. The exposition of the subject is preeminently practical and treatment is emphasized. The work reflects a vast amount of experience on the part of the authors in a field of growing importance, the industrial trauma. Part I is devoted to the principles and general aspects, such as repair of fractures, first aid and complications, and in addition offers a chapter on the workmen's compensation law affecting fracture cases and one on the medicolegal aspects of fracture cases. Part II deals with the diagnosis and treatment of specific injuries. The text is clear, concise and authoritative and, as already suggested, offers that which has been tested by experience and accepted as of value. The numerous roentgenograms are well reproduced and add much to the value of the text. The student, the surgeon and particularly the practitioner who comes in contact with the problems of industrial trauma will find in it much information of value.

**Gynecology and Obstetrics** By Edwin M. Jameson, M.D., Surgeon General Hospital, Saranac Lake, N. Y. Clio Medica, A Series of Primers on the History of Medicine, XVII. Edited by E. B. Krumbhaar, M.D. Cloth, Price \$2. Pp. 170, with 5 illustrations. New York: Paul B. Hoeber, Inc. 1932.

**Handbuch der Gynäkologie** Herausgegeben von Dr. W. Stoeckel, Geh. Medizinalrat, o. o. Professor an der Universität Berlin, Direktor der Universitätsfrauenklinik. Band XII, Teil I, Geschichte der Frauenheilkunde. I. Die Frauenheilkunde der Alten Welt. Von Dr. med. et phil. Dr. h. c. Paul Diepgen, o. Professor der Medizingeschichte in Berlin. Third edition of *Handbuch der Gynäkologie* by J. Velt. Paper, Price 30 marks. Pp. 348, with 64 illustrations. Munich: J. F. Bergmann, 1937.

These two volumes, published simultaneously, are an indication of the universal medical interest in the history of medical progress. The advancement of medical science takes place by the erection of a new construction on the solid foundation of established fact. Each year and each decade bring new material of importance. The contribution printed in German is part of a system of gynecology. It is printed on enamel stock, beautifully illustrated, and represents the typical exhaustive German method of production. It is concerned, of course, far more with ancient than with modern contributions. The American volume is one of the concise handbooks in the large series known as *Clio Medica*. It is a concentrated monograph supplemented by a bibliography, which includes a list of gynecologic and obstetric classics. For those interested particularly in obstetrics it is an immediately useful reference work.

**Enzyme Chemistry** By Henry Tauber, Ph.D., Consulting Chemist. Cloth, Price \$3. Pp. 243, with 28 illustrations. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Limited, 1937.

An understanding of enzymes and their actions is a prerequisite for any scientific worker who wishes to keep abreast of developments in the biologic sciences. Tauber's book provides a clearly presented but not comprehensive introduction to the present status of enzyme chemistry. Specific examples of each enzyme system are given. Particular care seems to have been exercised in selecting only the actually significant newer references for inclusion in the bibliography. As our knowledge of the fundamentals of biologic processes increases, elucidation of the role of enzymes in the body economy becomes progressively more important. Enzymes play a basic part even in such fundamental cellular units as the chromosomes. Enzyme chemistry, therefore, deserves the serious attention of physicians. This book will provide much of the necessary information.

**A Mind Misled** By Henry Collins Brown, Founder of the Museum of the City of New York. Cloth, Price \$2. Pp. 219. New York: F. P. Dutton & Co., Inc. 1937.

**A Mind Restored** The Story of Jim Curran. By Elsa Krauch. Introduction by William Seabrook. Cloth, Price \$2.50. Pp. 242. New York: C. P. Putnam's Sons, 1937.

**The Mentally Ill in America. A History of Their Care and Treatment from Colonial Times** By Albert Deutsch. With an Introduction by William A. White, M.D., D.Sc., LL.D., Professor of Psychiatry, George Washington University. Cloth, Price \$3. Pp. 530, with 8 illustrations. (Garden City, New York: Doubleday, Doran & Company, Inc. 1937.)

These are the days when autobiographic and biographic analyses of individuals form interesting items for the curious among the public. The author of "A Mind Misled" spent three years in an insane asylum recovering from a nervous breakdown. The institution in which he resided was the Bloomingdale Hospital. The author, who founded the Museum of the City of New York, was 75 years old when this book was published. In 1929 he entered Bloomingdale Hospital because of a mental disability. He describes with excellent humor the examinations on admittance, the patients whom he met, and the progress of his cure. The volume lacks the literary style or the sense of the dramatic that are available in Seabrook's "Asylum."

Much more of the literary flavor is to be found in the book called "A Mind Restored," which bears an introduction by Seabrook. It tells the story of a man who succumbed to the strain of modern big business and an emotional shock developing spells of depression and irritability and eventually progressing into disintegration of personality. After a brief sojourn in a private institution he voluntarily committed himself to a state institution and here he recovered. He offers in his final chapter some conclusions and some definite advice, namely, "Do not keep your troubles to yourself. Do not worry about every little thing. Learn to face reality at an early age. The author

sees certain faults in our present method of handling people who are mentally disturbed but, of course, he is unfamiliar with the growth and development of our legal procedure, which make some of his suggestions and hopes most difficult of realization.

Perhaps both these authors would have profited had they read before embarking on their memoirs the survey of "The Mentally Ill in America," by Albert Deutsch. This is a well written, authentic survey of our progress in the control of mental diseases, prepared by an author who has been guided by some of the greatest leaders in this field. He has observed the past and noted the changing concepts and modern trends in institutional care and toward mental hygiene. Today progress is exceedingly rapid and the extent of public obligation toward the mental defective is becoming more clearly defined. There are encouraging discoveries which are likely to change vastly the picture of this problem in the future. The interest of the intelligent public is itself likely to have a most salutary effect.

**Vergleichende Physiologie der Inneren Sekretion** Von Walter Fleischmann, Dr. med. et phil., Priv. Doz. für Physiologie an der Universität Wien. Mit einem Geleitwort von Professor Dr. A. Durlig. Paper, Price 6 marks. Pp. 147, with 16 illustrations. Vienna & Leipzig: Verlag von Moritz Perles, 1937.

Most of our information on internal secretions has been derived from experimentation and observation on various species of animals. Any textbook on endocrinology that merits the name must therefore be concerned largely with the comparative physiology of endocrine principles, the subject purportedly covered in Dr. Fleischmann's small volume. The difference between this and other more general treatises on the subject is chiefly one of emphasis. The very size of the book indicates that it must be quite incomplete, this suspicion is, of course, confirmed by perusal. An adequate treatise on comparative physiology of internal secretions must of necessity be encyclopedic. The author succeeds only in making available a small amount of information on the subject and in emphasizing that endocrine factors may act differently in various species, a point perhaps not sufficiently appreciated by clinicians. Provided its deficiencies and limitations are understood, this book may be useful for reference.

**Clinical Urinalysis and Its Interpretation** By Robert A. Kilduffe, A.M., M.D., F.A.S.C.P., Director of Laboratories, Atlantic City Hospital. Cloth, Price \$4. Pp. 428, with 40 illustrations. Philadelphia: F. A. Davis Company, 1937.

One might question the need for an additional textbook dealing with such a prosaic subject as urinalysis. But a careful perusal will convince the most skeptical that this book will satisfy a demand by many actively engaged in the practice of medicine. There has been a need for a concise and modern treatise on clinical urinalysis designed to serve the clinician. This book fulfills that purpose. While it is not intended to be encyclopedic in scope, few readers will find desirable information not included in its pages. The material is presented under three major divisions. The first part is devoted to a brief consideration of the anatomy and function of the normal kidney and the composition of normal urine. For the sake of completeness the characteristics of urine in the neonatal period should have been included. The second part is devoted to clinical urinalysis and its interpretation. This section occupies the major portion of the book. The information is explicitly stated and is brief and to the point. Besides the conventional subjects treated under this heading are chapters on renal function tests and their interpretation, dextrose tolerance tests and their interpretation, bacteriologic examination of urine, urine tests in the diagnosis of pregnancy, urinary concretions, the examination of urine for life insurance parasites which may be encountered in urine and urinary observations in common kidney diseases. The last section of the book is concerned with equipment for urinalysis in an office laboratory, formulas for reagents and test solutions and miscellaneous tables. The author has succeeded in presenting the reader with a thoroughly modern textbook on clinical urinalysis. It is particularly adapted for the practicing physician rather than for the specialist although it should serve the two equally well. It will be especially valuable to physicians engaged in life insurance work, as the author has stressed those methods which are recommended by or acceptable to insurance companies.

**Lehrgang für Impfärzte** Von Prof Dr med H A Gins Abtellsung  
direkt im Institut Robert Koch Berlin Veröffentlichungen aus dem  
Gebiete des Volksgesundheitsdienstes Schriftenreihe aus dem Arbeits-  
gebiet der Abteilung Volksgesundheit des Reichs und Preussischen Min-  
isteriums des Innern Band L Heft 1 (Der ganzen Sammlung 434 Heft)  
Paper Price 4 80 marks Pp 138 with 6 illustrations Berlin Ver-  
lagsbuchhandlung von Richard Schoetz 1937

This little book is one of a large series of publications dealing with matters of public health in Germany. The author, who is well known for his investigations of problems in vaccination and smallpox, presents an authoritative account of smallpox vaccination in its diverse aspects, historical, experimental, epidemiologic, clinical. The chapters on the preparation and control of vaccine and the technique and periods of vaccination describe the German methods and practices. The book will interest all who are concerned with the science and practice of vaccination.

**Careers After Forty** By Walter B Pitkin Cloth Price \$1.75 Pp 273 New York & London Whittlesey House McGraw Hill Book Company Inc 1937

The prolific Professor Pitkin rounds off twelve years of study of human beings with this new volume. His previous contributions, called "New Careers for Youth," "The Chance of a Lifetime" and "Life Begins at Forty," were steps in his progress. His literary style needs no further comment. His writing, like his speech, is a flight of words and ideas with parenthetical interruptions and exclamations. According to the professor, he bases his suggestions on records from the press and from his personal correspondence, and some of these are exceedingly interesting. In his concluding chapter, called "Campaigns Ahead," he offers suggestions for starting new organizations and ideas whereby those after 40 may carve out new careers for themselves. He attacks the ideas of the administration relative to keeping young people in school and is inclined to believe that the young are being overeducated. His solution for the problem of the unemployed is to bar from work those under 18 and those over 60, putting all those over 60 at work teaching those under 18 how to work. The plan is so simple that it is quite clearly simple minded.

**Why Grow Old? A Guide Book for the Man Who Seeks to Remain Physically and Mentally Young** By Frank S Caprio MD Psychiatrist Veterans Administration and Owsley (rant MD Clinical Professor of Urology University of Louisville Medical School Cloth Price \$2.50 Pp 204 Indianapolis Maxwell Broke Publisher 1937

The question in the title of this book cannot be answered now in any scientific manner, but it ought to make a good sales appeal. The book includes trite banalities, many of which are not strictly true. The Metchnikoff theory of auto-intoxication is dusted off and paraded as one of the possible causes of aging, true, the author does not explicitly endorse it, but he lists it in a manner which would indicate that he is not quite sure whether to believe it or not. The same treatment is accorded the Steinach operation. The body is referred to as "living cells nourished by a brain!" The English is crude. There is such a mixture of facts with pseudoscientific suggestion that the lay reader, for whom the book is written, cannot be expected to distinguish one from the other. The chapter on "the truth about rejuvenation" is far from the truth. The thesis of the book seems to be that, while one may be growing old physically, one can successfully delude oneself into the semblance of youth. Such doctrine is dangerous.

**Social Work Year Book 1937 A Description of Organized Activities in Social Work and in Related Fields** Edited by Russell H Kurtz Fourth Issue Cloth Price \$4 Pp 709 New York Russell Sage Foundation 1937

This volume published annually, includes articles by a considerable number of contributors who outline the status of various topics of social interest. It describes the various organizations concerned in various fields and makes available much important data on all the subjects it discusses. Of special importance for the medical profession is the chapter entitled "Medical Care." The announcement that it has been prepared by M M Davis and Marcella R Lehmann, also of the Rosenwald Fund will inform the medical profession as to what to expect. Most significant is the suggestion by Mr Davis that

families with incomes of from \$2,500 to \$5,000 a year must be a matter of public concern so far as relates to their medical bills. The chapter on health insurance in this yearbook was prepared by Herman A Gray, professor of law in the New York University School of Law. It is an endorsement of compulsory sickness insurance. If medical readers will use the volume with a recognition of the fact that it presents just one point of view throughout, they may find it useful as a work of reference.

**Faareblodlegemers antigene Struktur med særligt Henblik paa deres Antigenfællelskab med Menneskeblodlegemer** [Antigenic Structure of Blood Corpuscles of Sheep with Special Consideration of Antigenic Relationship to Human Blood Corpuscles] Af Torben Andersen With an English Summary Paper Price 10 kroner Pp 207 Copenhagen Levin & Munksgaard 1937

This is a thesis submitted for the doctor's degree. It deals with the antigenic structure of sheep blood corpuscles, with special reference to their antigenic relations to human blood corpuscles. There are besides the introductory sections six chapters in Danish, which at the end are summarized in a somewhat cumbersome English. The thesis will be of interest to those who are concerned with the problems of heterogenic antigens and corresponding antibodies under various conditions.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts Compensability of Hernia in Relation to Attendant Pain**—The plaintiff, while assisting a fellow employee in lifting a can of ice cream mix, felt a "snap" in his left side but felt no pain. He forgot about the instance and continued to work the remainder of the day. Early in the evening, while at home, he discovered a lump in his left groin. An examination by the company physician disclosed a "recurrent direct inguinal hernia with no tenderness or pain on the edges of the ring through which the protrusion came." The plaintiff's medical history revealed that about four years previously he was operated on for hernia on the left side and that about four months prior to the accident a pre-employment physical examination showed that the rings on both sides were enlarged. The compensation commissioner, in a proceeding under the workmen's compensation act of Connecticut, found that the "snap" which the plaintiff felt "is equivalent to feeling pain, when related to hernia" and that "he felt pain immediately following" an injury arising out of and in the course of his employment, and awarded compensation. On appeal, the superior court held that this finding was unwarranted and set aside the award of compensation. The employee thereupon appealed to the Supreme Court of Errors of Connecticut.

The workmen's compensation act of Connecticut prescribes the conditions under which compensation may be awarded for a hernia. Among those conditions is a requirement that the hernia be accompanied by evidences of pain. The underlying reason for special provisions in workmen's compensation acts relating to hernia, said the court, is that, owing to the nature of hernia and its onset, a lifting or straining, perhaps months before, may be assigned as the producing cause and the basis of a claim for compensation the merits of which, owing to lapse of time and lack of notice to the employer, are extremely difficult of just determination. The purpose is to restrict compensation to those cases in which there is relative coincidence of accident and some significant manifestation of a hernia resulting therefrom. In *O'Brien v Wise & Upson Co Inc*, 108 Conn 309, 143 A 155 it was said:

If this were a matter of which we could take judicial notice we would find surgical authority holding that a hernia which was actually caused by a strain is ordinarily accompanied by pain and immediate inability to proceed with the work that was being done.

In the present case, the uncontradicted medical testimony was to the effect that ordinarily a traumatic hernia "comes through in a hurry, it does some damage coming through, tears the ring

Dr. Robert Hellig Alvani

C. C. C. Medical College

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at least stretches it to a point when there is some fibre rupture, with accompanying tenderness and pain." Nontechnical definitions of "pain," said the court, while varying in form of expression, all connote some degree of distress or suffering. The workmen's compensation act of Connecticut goes further than to render pain attending injuries sufficient of itself to render hernia compensable, it requires that the injury be "accompanied by evidences of pain." Therefore it would not be sufficient if the employee felt pain subjectively, it must be manifested objectively by some outward sign or indication. Evidence of this kind may be afforded in various ways, as by observed involuntary gesture, facial expression, or exclamation indicative of distress.

The court felt constrained to hold that the trial court was correct in determining that the findings of the compensation commissioner that the "snap" was equivalent to pain lacked support from the record. The plaintiff, who appeared at the hearing without counsel and was examined by the commissioner, naively or frankly disclaimed repeatedly that he felt any pain, stating that he "felt the snap, it didn't hurt, I forgot all about it, I didn't know I was hurt, I kept on working." The judgment of the trial court denying compensation was therefore upheld—*Ardum v General Ice Cream Co (Conn)*, 192 A 314.

**Workmen's Compensation Acts Symptoms of Death from Inhalation of Coal Gas**—The workman was employed as a janitor and his duties required him to take care of and coal a water heater in the cellar in the building at which he was employed. He was found in a comatose state in a pit in the cellar and unsuccessful efforts were made to resuscitate him. There was present an odor of coal gas, the intensity of which was variously estimated by different witnesses. There was no autopsy. In a proceeding under the workmen's compensation act of New Jersey, an award of compensation to his widow was sustained by the court of common pleas, and the employer brought certiorari to the supreme court of New Jersey.

The single question before the court was whether the workman met his death as the result of an accident. It was not controverted that, if he died from asphyxiation by coal gas, his death was from accident arising out of and in the course of his employment. The employer denied that the workman died of asphyxiation. The death certificate executed by the coroner, said the court, gave coal gas as the cause of death. In view of the testimony of the coroner, however, that he inserted the cause of death as the result of a conversation with the acting county physician, who made no investigation and did not see the body of the workman, the certificate was without probative value as to the cause of death. On behalf of the claimant, an expert stated that, given a man in good health, who was found unconscious in a cellar where a coal burning hot water heater was in operation and where the odor of coal gas was apparent, the natural assumption would be that the ensuing death resulted from a toxic effect of some gas in the cellar. On behalf of the employer, an expert testified that, in view of the symptoms testified to by a number of witnesses for both parties, particularly that the appearance of the workman was natural and normal and there was no vomiting, it was his opinion that death was not attributable to carbon monoxide poisoning. The witness testified that in cases of coal gas poisoning there is a marked change in the color of the skin, and further:

There are two types of appearance that are common—In the one definite bluing or a definite cyanosis is noted although more commonly there is a definite pinkish or purplish red series of hemorrhages in the skin distributed generally over the face the chest the arms the legs and occasionally the back. The blood itself is a very characteristic bright red and this bright red color can be used as a means of identification of death of this type because it is striking it is easily measured and it persists for many days even weeks after death has occurred.

In view of the explicit and uncontradicted testimony of the latter witness the court said, and of the witnesses who testified that the symptoms said to be present in coal gas asphyxiation cases were not present in the instant case the conclusion was inevitable that the testimony overthrew any presumption adduced from the circumstance that there was an odor of coal gas in the cellar when the workman was found that coal gas asphyxiation was the cause of death. Two physicians observed

the court, examined the workman after he was removed from the cellar, but neither of these was called as a witness. Weighing all the testimony, the court concluded, it preponderated in favor of the conclusion that it was not shown that the workman met his death from coal gas asphyxiation. The judgment of the court of common pleas upholding the award was therefore reversed—*Ridgeway v Real Estate Operating Co (N J)* 192 A 392.

## Society Proceedings

### COMING MEETINGS

American Association for Thoracic Surgery Atlanta Ga Apr 4-6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary  
American Association of Anatomists Pittsburgh Apr 14-16 Dr George W Corner 260 Crittenden Blvd Rochester N Y Secretary  
American College of Physicians New York Apr 4-8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary  
American Orthopsychiatric Association Chicago Feb 24-26 Dr Norvelle C La Mar 210 East 68th St, New York Secretary  
American Physiological Society Baltimore Mar 30-Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary  
American Society for Experimental Pathology Baltimore Mar 30-Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary  
American Society of Biological Chemists Baltimore Mar 30-Apr 2 Dr H A Mattill Chemistry Bldg State University of Iowa, Iowa City Secretary  
American Therapeutic Society New York Apr 1-2 Dr Oscar B Hunter 1835 Eye St NW Washington D C Secretary  
Federation of American Societies for Experimental Biology Baltimore Mar 30-Apr 2 Dr D R Hooker 19 West Chase St Baltimore Secretary  
Pacific Coast Surgical Association Los Angeles Feb 22-25 Dr H Glenn Bell, University of California Hospital San Francisco Secretary  
Southeastern Surgical Congress Louisville, Ky March 7-9 Dr B T Beasley 701 Hurt Bldg Atlanta Ga, Secretary  
Tennessee State Medical Association Nashville Apr 12-14 Dr H H Shoulders 706 Church St Nashville, Secretary  
Tri States Medical Association of the Carolinas and Virginia Asheville N C Feb 21-22 Dr J M Northington 804 Professional Bldg Charlotte N C Secretary

### CENTRAL SOCIETY FOR CLINICAL RESEARCH

Tenth Annual Meeting Held in Chicago Nov 5 and 6 1937

The President, DR DAVID P BARR, St Louis, in the Chair

#### Poliomyelitis Studies on Route of Entrance of Virus

DRS PAUL H HARMON and VICTOR LEVINE, Chicago In eight of nine fatal cases of poliomyelitis the microscopic lesions were more widespread than the clinical appearances would indicate. Careful studies of the olfactory bulbs disclosed slight lesions in only two cases. Intracerebral inoculation into monkeys of nervous tissue taken from every case was successful in only four instances. Rectal and nasal washings from twenty convalescent patients were injected into monkeys, with takes in four cases, only from rectal washings. The studies of the olfactory bulbs and the experiments with washings suggest that the virus enters the brain in man by some other route than through the olfactory route, perhaps the gastrointestinal tract.

#### DISCUSSION

DR MOSES BARRON, Minneapolis Have feeding experiments with poliomyelitis material been attempted? If the disease gains its entrance through the intestinal tract, feeding experiments with some of the material in capsules should help substantiate the theory.

DR GEZA DE TARATS, Chicago Were there any changes in the lateral horns or in the anterior roots that would explain some of the vasomotor phenomena found in poliomyelitic extremities?

DR VICTOR LEVINE, Chicago We have not performed any feeding experiments. Attempts to produce the disease in monkeys by feeding infected material have been made by others with unsatisfactory results. The microscopic lesions of the spinal cords were not limited to the anterior horns of the gray matter. In most levels examined the posterior horns (and where present the lateral horns) as well as the white matter showed pathologic changes.



### Effects of Serum Treatment in 600 Cases of Acute Tularemia

DR. LEE FOSHAY, Cincinnati The control series comprises 481 untreated cases of acute tularemia. There has been no selection whatever in the establishment of either the treated or the untreated groups beyond the verification of diagnosis and the exclusion of cases of chronic tularemia infection. Hence the series are strictly comparable. The observed clinical effects of serum therapy were moderate to very marked diminution in intensity and shortening of duration of symptoms due to toxemia—headaches, fever, arthralgias, myalgias, nausea, vomiting, amelioration and lessened duration of pain in primary lesions and in buboes, an extremely marked and rapid cessation of all symptoms of disease in patients with the typhoidal form of the infection in which there are no adenopathies to prolong convalescence, and an almost complete absence of complications and sequelae in patients with this type, slowing and then cessation of extension of areas of tularemia pneumonia with absence so far of complications and sequelae of pneumonia, no mortality in adequately treated patients with pneumonias in the absence of (a) tularemia septicemia and (b) preexisting disease, failure of septicemia (the chief mode of death) to develop after serum administration. Statistical analyses of morbidity and mortality data confirm the significance of the clinical observations.

#### DISCUSSION

DR. WALTER M. SIMPSON, Dayton, Ohio During the years 1929 to 1931, eight patients with the acute manifestations of tularemia were given transfusions of from 200 to 500 cc of blood from persons who had made a satisfactory recovery from the disease during the preceding year. The use of immune serum apparently exerted a distinctly favorable influence on the duration and severity of the disease. Since 1932 we have utilized the Foshay serum in the treatment of thirty-two cases of tularemia that occurred in and around Dayton. Twenty-eight cases were of the ulceroglandular type, two were glandular, one was oculoglandular and one was typhoid. When the course of the disease following serum therapy in these thirty-two patients was compared with the course of the disease in approximately 100 patients who did not receive serum therapy, there was little doubt that the serum had exerted a beneficial influence. This was particularly true in the severe cases. The effect of serum therapy in the latter usually appeared within twelve to twenty-four hours and was characterized by distinct amelioration of the toxic manifestations of the disease, such as headache, nausea, vomiting, joint pain, backache and prostration. Unless extensive suppurative lymphadenopathy was already present before serum was administered, the affected lymph nodes usually diminished in size and the incidence of subsequent suppuration was lessened. The pain in the region of the primary lesion and lymphadenopathy was unusually less within forty-eight hours following serum therapy. The fever usually exhibited a declining trend within forty-eight to seventy-two hours. Serum sickness occurred in 41 per cent of our cases. The serum sickness was mild in all but three cases. The frequent occurrence of serum sickness has caused us to avoid using the serum in mild cases. In three unusually severe cases complicated by pneumonia in one instance, by advanced coronary heart disease and pneumonia in another, and by severe acute coronary heart disease with heart block in the third, the administration of the serum was apparently life saving. Larger doses of serum (from 60 to 90 cc.) are required. The results were best when the serum was administered during the first two weeks of the disease. The use of the Foshay intradermal test makes it possible to confirm the diagnosis before the agglutination test becomes positive. Our experiences lead us to conclude that Foshay's intradermal diagnostic test and the early administration of adequate amounts of serum, particularly in the severe cases, provide a distinct advance in the management of tularemia.

### A Soluble Edema Producing Substance from Pneumococci

DRS. W. P. SUTLIFF and T. E. FRIEDMAN, Chicago One cc of Berkefeld filtrate of pneumococcus culture injected into the subcutaneous of puppies produces spreading edema varying from 16 to 50 sq. cm in area. The edema producing substance is present in cultures of pneumococci in serum and

in extracts and edema fluid obtained from the lungs of dogs dying of pneumonia. It is found in cultures after four hours' active growth, when bacterial autolysis is at a minimum. It is heat stable. It does not appear to be antigenic. It is not associated with soluble specific substance. It is suggested that this substance may be responsible for edema occurring in pneumococcal infections.

#### DISCUSSION

DR. LEE FOSHAY, Cincinnati Is intradermal injection of pneumococci into the edematous areas in the skins of rabbits followed by increased invasiveness and shortening of the survival periods of the animals? Does the injection of the organisms into the areas of edema place them in a situation more favorable for multiplication and dispersion?

DR. O. H. ROBERTSON, Chicago Dr. Sutliff has been able to isolate this edema producing substance early in the growth of the pneumococci and from the lungs of animals suffering from lobar pneumonia. These observations have a direct relationship to inflammatory lesions in lobar pneumonia. Other toxic products which various workers have isolated from pneumococci have depended on autolysis of the micro-organism. Observations on human patients and the results of experimental pneumococcal pneumonia have shown that edema is a conspicuous part of the early lesion and this occurs at a time when autolysis is at a minimum. Hence these results indicate that the pneumococcus does produce a soluble product early in its growth which will account for many of the pathologic observations in lobar pneumonia.

DR. W. D. SUTLIFF, Chicago In answer to Dr. Foshay's question, comparative studies of experiments done with different culture materials in different animals would be required to determine whether the same material has been employed by others. However, observations have been made with killed pneumococcus cultures in the skin of rabbits according to the technic of Duran-Reynals. No edema results from these injections, but particulate matter spreads readily in areas prepared by the injection of killed pneumococcus cultures. Goodner has reported that pneumococcal infections spread rapidly in the skin of rabbits when autolyzed cultures of pneumococci are injected simultaneously with the infecting dose of pneumococci. It is uncertain whether there is any relationship between these phenomena and edema production in the skin of puppies produced by injection of filtered young cultures of pneumococci.

### Sulfanilamide in the Treatment of Experimental Endocarditis

DRS. R. O. MUETHER and RALPH A. KINSELLA, St. Louis Five dogs each weighing from 10 to 12 Kg. were operated on under phenobarbital anesthesia. The mitral valve or some part of the adjacent endocardium was injured, as has been described in previous reports. A suitable interval was allowed to elapse, after which 10 cc of twenty-four hour plain broth culture of nonhemolytic streptococcus was injected intravenously. Blood cultures were taken at frequent intervals. Two successively positive cultures at three day intervals were considered evidence of successful infection. The dogs were then fed sulfanilamide (three 5 grain [0.3 Gm.] capsules three times a day) by the stomach tube. Blood cultures were taken daily until five daily blood cultures were negative. The medication was stopped, but blood cultures were continued to make certain that the dogs would not develop positive cultures again. Five dogs were studied in this manner, all dogs showing positive cultures following the first injection of bacteria. Four dogs responded to the treatment, showing repeatedly negative cultures, and are alive after five months. One dog succumbed to the disease in spite of identical treatment. Thirty-one, sixty, seventy-eight and forty-two days of daily treatment were required to free blood of bacteria. No deleterious action of the drug was observed. The dog that died had received sulfanilamide for thirty-six days.

#### DISCUSSION

DR. L. N. KATZ, Chicago At the Michael Reese Hospital Drs. Friedman, Howell and myself found that fundamentally the persistence of the infection was due to the protection of the organisms in the infected valve by fibrin from the action of phagocytes. We know from recently published reports that sulfanilamide appears to act as a phagocytic stimulant. It does



not, therefore, help in eradicating the infected focus. What Muether has demonstrated is the action of sulfanilamide on the bacteria in the blood. It is not enough to clear the blood stream to cure this disease, the problem is to stop the growth of the organisms in the valve. Positive blood cultures in the experimental animal give no proof of endocarditis. We know from unpublished experiments which Drs. Hamburger, Strauss and I did a few years ago that a series of positive blood cultures can occur without vegetations but with isolated involvement of various parts of the body. I would like to see positive evidence that an endocarditis has been established in the animals reported on by Dr. Muether before concluding that the sulfanilamide had caused any definite effect, particularly since clinical experience indicates that the drug is not effective in patients with subacute endocarditis.

DR A. R. BARNES, Rochester, Minn. I have observed some cases of subacute bacterial endocarditis in which sulfanilamide had been given before the patients came under my observation. The number of such cases in which the blood cultures have been negative is striking, in spite of the clinical evidences of subacute bacterial endocarditis and the final proof at necropsy. This observation indicates, first, that more and more cases of subacute bacterial endocarditis with negative blood cultures are going to be seen and, second, that it is possible to render the blood stream free from green-producing streptococci without affecting the lesion in the valve or the course of the disease.

DR J. M. RUEGSEGER, Cincinnati. I am interested in the postmortem observations and especially in the patients who recovered. What did the heart valves look like? In the dogs that died with or without treatment how long did it take to develop good sized vegetations in the valves?

DR C. A. DOAN, Columbus, Ohio. Have any blood chemistry studies been done on the concentration of the drug in the blood stream?

DR R. O. MUETHER, St. Louis. Our previous experience with the production of bacterial endocarditis in dogs is such that we know that vegetations can be produced on damaged valves. We have many sections and pathologic specimens which demonstrate that fact. We know that we can cure these dogs. It is my definite feeling that sulfanilamide is of no value in the treatment of subacute bacterial endocarditis in man. No chemical tests were made to determine the presence of the drug in the blood stream. By the method we use, vegetations have developed in from forty-eight to seventy-two hours after infection occurred.

#### Coronary Artery Occlusion: Electrocardiographic and Postmortem Observations and Length of Survival

DRS F. J. JANEY SMITH, BEN E. GOODRICH and ROBERT J. NEEDLES, Detroit. In a fourteen year period 2,540 autopsies have been done, forty-four of which showed evident coronary artery occlusion. Thirty of these were studied electrocardiographically, twenty-four with standard three leads only, and six with the addition of precordial leads. Nineteen cases had single fresh infarcts at autopsy, sixteen of which were anterior and three diaphragmatic surface or posterior. Eight showed old occlusions without fresh infarction, and three fresh infarcts combined with old. The standard three lead electrocardiograms were divided into T and Q types when possible according to the method of Barnes and Whitten and of Wilson as probably indicating "anterior" or "posterior" infarction or were called "indeterminate." Of the fresh single infarctions the standard three lead tracings were consistent with the actual location of the infarct in six cases, inconsistent in three and negative or indeterminate in eleven. Six cases of fresh single left coronary occlusion were studied with the addition of precordial leads. Four of these showed absent Q waves and two were not abnormal. Out of 143 clear cut clinically diagnosed cases of coronary artery occlusion 106 can be traced. Eighty patients are dead. These patients' electrocardiograms, the great majority of standard three leads only, are divided into types as suggesting "anterior" or "posterior" or "indeterminate." The time of death after occlusion or length of survival did not indicate any important difference in prognosis for the "anterior" or "posterior" type or electrocardiogram.

#### DISCUSSION

DR W. B. COOKSEY, Detroit. I agree with the authors that localization of the cardiac infarct does not seem of great diagnostic or prognostic value. My studies have led me to believe that mortality is lower than they have reported. However, I believe that Dr. Masters of New York, who brings the mortality of coronary thrombosis down to 8 or 10 per cent, errs in the opposite direction. The New York studies have given me the impression that too many small occlusions or borderline cases have been included, which probably does not represent the real problem of coronary thrombosis. The work reported by Drs. Smith, Goodrich and Needles represents a select hospital group, frequently with such severe symptoms that hospitalization is a last resort. Those of us who see patients in their homes as well as in the hospital see all kinds, some severe and some mild. I believe that the immediate mortality and later mortality is not so great as the figures of the authors would lead us to believe. I had one patient who died during the winter of a coronary occlusion, thirty-nine years after his first occlusion. Another one has survived seventeen years.

DR A. R. BARNES, Rochester, Minn. One gets the impression from the literature that infarction involving the anterior portion of the left ventricle has a much greater mortality than posterior infarction. This may be true with respect to the immediate mortality, but it is not true as far as the ultimate mortality is concerned. Our studies in 370 cases of infarction revealed that there was no essential difference between life expectancy of those patients who had anterior and of those who had posterior infarctions.

DR L. N. KATZ, Chicago. Have the experiences of the authors coincided with those of Dr. Bohning and myself, namely, that the electrocardiograms giving diagnostic difficulties are those associated with extensive arteriosclerosis of the coronary arteries, whereas coronary thrombosis without much coronary sclerosis gives the more typical curves?

DR G. T. REUSS, Dallas, Texas. How many patients had infections and what was the mode of death?

DR ROBERT J. NEEDLES, Detroit. We were careful in selecting cases and threw out a great many on the basis of their not being true cases of occlusion. In the 161 cases of acute coronary occlusion, the mortality figures were as indicated. As to Dr. Katz's questions on differentiation of the location of infarction in the arteriosclerotic and the nonarteriosclerotic cases, our feeling is that his statements are in accord with our experience with regard to this point, but we have not made any accurate analysis of this particular phase of the subject. Many patients do die suddenly, but we have not analyzed the exact figures from this point of view.

#### Incidence of Arteriosclerosis of the Coronary Arteries in an Essential Hypertension

DRS A. E. FELLER and FRED M. SMITH, Iowa City. The terms hypertensive heart disease, arteriosclerotic heart disease and coronary artery disease are confusing in that they refer to the same general form of cardiac disability. It has seemed that perhaps hypertension has been overemphasized as a cause of cardiac disability and possibly the factor sclerosis of the coronary arteries frequently overlooked. In order to get more definite information on this question, a series of 353 cases of essential hypertension was carefully analyzed with reference to possible manifestations of coronary artery disease. The diagnosis of sclerosis of the coronary artery was made in 115 instances (32.6 per cent). This diagnosis was based on a history of angina of effort, paroxysmal or nocturnal dyspnea or coronary occlusion, and the electrocardiographic changes in eighty-three patients and on the electrocardiographic changes alone in thirty-three patients. There were in addition to these 117 patients with abnormal electrocardiograms, many of whom presented suggestive clinical manifestations of coronary artery disease. Of the ninety-five cases of cardiac failure a significant involvement of the coronary arteries was believed to be present in sixty (63.2 per cent). Twenty-two cases came to necropsy and sclerosis of the coronary vessels was found in nineteen. The clinical diagnosis of this condition had been made in twelve.

(To be continued)

## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Ophthalmology, St. Louis

20 1189 1290 (Dec.) 1937

- Comparative Study of Experimental and Clinical Exophthalmos G K Smelser New York—p 1189  
Effects of Anoxemia on Ocular Movements While Reading, with Especial Reference to Patients with Motor Anomalies R A McFarland C A Knehr and C Berens New York—p 1204  
Lighting Standards W B Lancaster Boston—p 1221  
Removal of Lead Shot from Vitreous by Use of Biplane Fluoroscope W E Borley and E Leef San Francisco—p 1232  
Recent Advances in Surgery of Chronic Glaucoma O Barkan San Francisco—p 1237  
Some Technical Questions in Cataract Surgery W F Moncreiff, Chicago—p 1245

#### American Review of Tuberculosis, New York

37 1124 (Jan.) 1938

- Notes on Choice of Roentgenologic Diagnostic Methods C Weyl S R Warren Jr and D B O'Neill Philadelphia—p 1  
Auxiliary Techniques in Chest Roentgenography C J Zintheo Jr, Richmond Highlands Wash—p 14  
Roentgenographic Features of Tuberculosis in Bones and Joints C G Sutherland and E A Addington Rochester Minn—p 31  
\*Hernia of Lung Intercostal, Cervical and Mediastinal E Korol, Lincoln Neb—p 39  
Relative Value of Fluoroscopic Roentgenographic and Physical Examinations in Tuberculosis Case Finding Program in University Students Ruth E Boynton, H S Diehl and C E Shepard Minneapolis—p 49  
The Degree of Tuberculosis in New Cases P K Telford Los Angeles—p 57  
Psychotherapy of Rehabilitation of Patients in Tuberculosis Hospitals C M Hineks Toronto—p 61  
Prognosis of Cavity Bearer H Schwatt and A Rest, Spivak, Colo—p 65  
Tuberculous Mediastinitis Report of Case with Focal Reaction to Tuberculin R H Kampmeier New Orleans—p 71  
Intrapleural Fibrin Bodies Observations on Their Development During Pneumothorax Treatment S A Robins and M H Jorress Boston—p 81  
Hemorrhage in Pulmonary Tuberculosis C K McCarthy Rutland Mass—p 88  
Course of Experimental Pneumococcal Infection in Tuberculous Rabbits J Weissfeiler E N Morozova and A I Strukov, Moscow, U S S R—p 93

**Hernia of the Lung**—Korol states that hernia is to be distinguished from prolapse of the lung. In the latter condition the parietal pleura is ruptured and there is no hernial sac. Until now hernias of the lung have been classified, according to location, into cervical, intercostal and diaphragmatic hernias. Mediastinal hernias are the most common pulmonary form of hernia and are increasing in frequency with the practice of artificial pneumothorax. Therefore mediastinal hernia of the lung should be included in the general classification of these hernias. In the external hernias there is a tender swelling which increases on exertion and on coughing. The overlying skin is normal in color and freely movable. The swelling has a typical air cushion feel. The swelling can be reduced by manipulation, often with a gurgling noise. The percussion note is hyperresonant and the breath sounds are harsher than over the neighboring wall of the chest. The mediastinal hernia of the lung gives no symptoms, and the physical signs are few. In cases of marked asymmetry of the chest caused by fibrosis or atelectasis of one lung, one may look for signs of mediastinal hernia. The hyperresonant percussion note of the emphysematous lung may extend across the midline between the first and third ribs anteriorly and at the base of the lung posteriorly. The respiratory appearance is characteristic. The large hyperaerated lung is seen to extend into the opposite side in the form of one or two bulgings, having well defined convex outer borders. The upper bulge which can be shown to be anterior by fluoroscopic examination, reaches from the first to the fourth rib

The lower bulge extends from the level of the fifth or sixth dorsal vertebra to the diaphragm. The trachea is displaced to the contracted side. The apex of the hypertrophied lung has also extended into the contracted hemithorax and its outer border can be seen through the tracheal transparency at a considerable distance from the midspine. Examination of the esophagus will show its displacement. Mediastinal lung hernia may be considered a rather common condition. One reason for the tardy recognition of this form of hernia is the fact that during postmortem examination of the chest the herniating lung collapses and the hernia becomes inconspicuous.

#### Annals of Internal Medicine, Lancaster, Pa

11 867 1076 (Dec.) 1937

- Plasma Colloid Osmotic Pressure as Factor in Edema Formation and Edema Absorption A C Kerkhof Minneapolis—p 867  
Cutaneous Manifestations in Psychotic and Psychoneurotic Individuals E T Bogen St. Cloud Minn—p 881  
\*Analysis of Sixty Two Cases of Primary Carcinoma of Liver Based on 24,400 Necropsies at Bellevue Hospital E G Gustafson New York—p 889  
Clinical Use of Crystalline Insulin S S Altschuler Elmore Mich—p 901  
Electrocardiographic Changes Following External Chest Injury to Dog R W Kirsane R S Fidler and R A Koons Columbus Ohio—p 907  
Adrenal Cortical Tumor Report of Four Cases C H Lawrence Boston—p 936  
Autopassive Transfer in Allergy D M Cowie, Ann Arbor Mich—p 949  
Some Physical Phenomena Associated with Anxiety States and Their Relation to Hyperventilation W J Kerr, J W Dalton and P V Giebe San Francisco—p 961  
Rectal Stenosis from Roentgen Therapy Report of Two Cases T G Miller Philadelphia—p 993  
Pancreatitis and Diabetes H O Mosenthal New York—p 1001  
Variability of Basal Metabolism Some Observations Concerning Its Application in Conditions of Health and Disease W M Boothby J Berkson and W A Plummer Rochester Minn—p 1014  
Cardiac Hypertrophy Its Relation to Coronary Arteriosclerosis and Congestive Heart Failure D Davis and H L Blumgart Boston—p 1024  
Effect of Vitamin C on Culture of  $H^{27}$  Tubercle Bacillus F H Heide and W Steenken Jr, Trudeau, N Y—p 1039

**Primary Carcinoma of Liver**—In 24,400 consecutive necropsies performed at Bellevue Hospital from 1906 to 1936, Gustafson collected data on sixty-two cases of primary carcinoma of the liver. In selecting these cases the classification and diagnostic criteria suggested by Eggel were adhered to. The majority of these patients entered the hospital with complaints referable to the liver. In the usual case there were two or three major complaints. However, patients with vague gastro-intestinal symptoms, pain in the right upper quadrant (frequently simulating that of cholecystitis) and rapidly accumulating ascites comprise the largest group of cases. Loss of weight as a symptom has an apparently minor part, having been mentioned in only five cases. This may be explained on the basis of the counteracting gain of weight due to ascitic accumulation. Several patients sought medical attention because friends noticed their rapidly increasing girth. Edema, especially of the dependent sort, was complained of by only five patients, although it was found more frequently on physical examination. It usually appears late in cases of primary carcinoma of the liver and is of differential significance in patients with complaints referable to cardiac decompensation. Fever as a chief complaint was present in only two cases. Hematemesis occurred only once, as did diarrhea. The former fact is of interest because of its higher incidence in uncomplicated cirrhosis of the liver. In primary carcinoma of the liver the course is much shorter from the onset of symptoms to death than is that of cirrhosis of the liver. Collateral circulation is not as well established as it is in cirrhosis of the liver. The average course from onset of symptoms to death was 3.2 months. The diagnosis will be made more often if its relative frequency is borne in mind. Each of the sixty-two cases fulfilled at least four of the following criteria: a male patient more than 35 years of age; a large palpable tumor mass in the right lobe of the liver; no primary tumor discoverable elsewhere; jaundice (usually mild), ascites and an otherwise unexplainable fever of mild degree, and in the majority of cases five or even all of them. The author believes that a history of either vague gastro-intestinal nature of short duration or signs of portal obstruction in the form of rapidly

accumulating ascites should be used as additional information. The history of rapidly accumulating ascites in primary carcinoma of the liver is in contradistinction to that of ascites due to other causes—cardiac failure, tuberculosis or carcinomatosis of the peritoneum. In ascites of cardiac origin, evidence of its cause is practically always available. In ascites of peritoneal origin due to carcinoma, tuberculosis or the like causal factors are likewise apt to present themselves. On the other hand, rapidly accumulating ascites may be due to thrombosis of the portal vein of variable origin. In this connection it is to be recalled that neoplastic thrombosis of the portal vein not infrequently occurs in association with primary carcinoma of the liver.

### Annals of Surgery, Philadelphia

107 1 160 (Jan) 1938

- Further Clinical Experiences with 95 per Cent Oxygen for Absorption of Air from Body Tissues J Fine L Hermanson and S Frehling Boston—p 1
- Results in Operative Treatment of Major Trigeminal Neuralgia F C Grant Philadelphia—p 14
- \*Spasmodic Torticollis Treated by Plastic Reduction of Motor Fibers of Spinal Accessory Nerve Report of Two Cases C B Masson, New York—p 20
- Complete Sympathetic Denervation of Upper Extremity A Kuntz W F Alexander St Louis and C L Furcolo Springfield Mass—p 25
- Prophylactic and Active Use of Zinc Peroxide in Foul Smelling Mouth and Neck Infections F L Meleney New York—p 32
- Glossitis Rhombica Mediana H E Martin and M Elizabeth Howe New York—p 39
- Plastic Reconstruction of Esophagus C Eggers, New York—p 50
- Inflammatory Tumors of Gastrointestinal Tract G S Dudley and L Miscall New York—p 55
- \*Nonspecific Granulomas of Intestine R Colp, New York—p 74
- So Called Hepatorenal Syndrome J H Garlock and S H Klein New York—p 82
- Tumors Ventral to Sacrum L D Whittaker and J deJ Pemberton Rochester Minn—p 96
- Intramedullary Dermoid Cyst F K Bradford Chicago—p 107
- Tears of Supraspinatus Tendon Resume of Twelve Operated Cases T A Outland and W F Shepherd Sayre Pa—p 116
- Dupuytren's Contracture A B Gill Philadelphia—p 122
- Globose Tumor Glomangioma A Kolodny New York—p 128
- Internal Fixation for Recent Fractures of Neck of Femur M S Henderson Rochester Minn—p 132

**Spasmodic Torticollis Treated by Reduction of Motor Fibers**—Masson suggests that a complete section of the eleventh nerve on one or both sides followed by a partial resection may not be adequate in every case of spasmodic torticollis but should be used first, since it is a less serious operation and more conservative. This conservative method of treating spasmodic torticollis has given satisfactory results in two cases. The method is similar to that used by Dogliotti in treating the facial nerve for facial spasms of an organic nature namely, a plastic reduction of motor fibers. The operation is less hazardous than cervical root and intradural, spinal accessory nerve section. If, in any case, a satisfactory result is not obtained, the latter procedure, which stops spasmodic movements but deprives the patient of considerable motor power in the neck and shoulders, may be resorted to.

**Nonspecific Granulomas of Intestine**—Colp presents six instances of nonspecific granulomas of the intestine. The first five are examples of regional ileitis. The disease is so protean in its clinical manifestations that it is rarely diagnosed preoperatively. The diagnosis in case 1 was made by the roentgenologist and in cases 2, 3 and 4 only at the time of operation. The surgical treatment is far from standardized and the efficacy of the various procedures employed will be determined, and correctly evaluated, only after careful follow-up examinations have been made over long periods of time. The type of operation for regional ileitis should be largely determined by the extent of the pathologic change of the diseased ileum. Case 5 is one of recurrence after radical resection. In 1931 an ileocecal resection for nonspecific terminal ileitis was performed about 40 cm of the ileum, the cecum and a portion of the ascending colon being removed. Roentgenologic examination in 1933 showed some irregularity of the anastomosed terminal ileum but it was not until 1936 that the patient began to complain of increasing abdominal pain. At this time x-ray examination revealed marked changes in the terminally anastomosed ileum which operation verified. The ileum was divided again through healthy intestine and an ileosigmoidostomy was performed. The prognosis in these particular cases must be guarded. Case 6 is presented as another type of nonspecific

granuloma of the intestine, belonging to the group of localized hypertrophic colitis. Similar to the majority of these cases, this patient gave a history of a mild colitis accompanied by elevation of temperature. Physical examination disclosed a palpable mass in the right lower quadrant. X-ray examination revealed a constricting lesion confined to the right half of the intestine. Because of the patient's poor general condition, a two stage procedure for resection was decided on. Following division of the terminal ileum and performance of an ileosigmoidostomy, the patient improved so markedly that the second stage was deemed unnecessary.

### Canadian Medical Association Journal, Montreal

37 525 620 (Dec) 1937

- Diverticulitis of the Sigmoid Colon Radiologic Study A C Singleton and M R Hall Toronto—p 525
- \*Frontal Lobe Tumors Clinical and Physiologic Study H H Hyland and E H Botterell Toronto—p 530
- Stricture of the Esophagus G E Hodge and E E Scharfe Montreal—p 541
- Prenatal and Postnatal Care H B Atlee Halifax N S—p 547
- The Present Opportunities for Medical Men in Anesthesia J S Lundy Rochester Minn—p 552
- The Clinical Problem of the Nodular Breast W F Gillespie Edmonton, Alta—p 555
- Roentgen and Ultraviolet Radiation in Dermatology Uses and Limitations D E H Cleveland, Vancouver B C—p 558
- The Acute Abdomen Caused by a Meckel's Diverticulum D C Collins Los Angeles—p 564
- Arrested Development of the Rectum Report of Case and Review of Embryology and Anatomy Concerned E A Daniels Montreal—p 566
- Sterility E Couture Ottawa Ont—p 570
- X-Ray Therapy in Bronchial Asthma J M McEachern Winnipeg Manit—p 573
- Rocky Mountain Spotted Fever in Canada J H Duncan Manyberries Alta—p 575
- Ectopia Pancreatica Duodenalis W C Whiteside Edmonton Alta—p 577
- Development of Femoral Sheath C R Salsbury, Kingston Ont—p 579

**Frontal Lobe Tumors**—Hyland and Botterell present an analysis of thirty patients with tumors involving one or both frontal lobes. In each instance the tumor was verified at operation or necropsy and no instance has been included in which the tumor was shown to involve adjoining lobes of the brain. These thirty cases constitute about 10 per cent of the total number of verified tumors of the brain admitted to the Toronto General Hospital from 1930 to 1936. Seven of the patients made no complaint of headache, it is important to appreciate that a cerebral tumor may incapacitate a patient in the absence of any headache. There was vomiting in five cases, which was in no instance projectile in character. It was always preceded by nausea and differed in no essential way from vomiting seen in other diseases. Epileptiform seizures occurred in fourteen cases. The frequency of the seizures varied greatly in the different cases. Of the nine patients with failing vision, one had a meningioma. In this case dimness of vision was the first complaint and was due presumably to direct pressure on the optic nerves and chiasma. In the remaining eight, visual failure was associated with optic atrophy consecutive to marked papilledema. The visual failure in these cases was progressive but in several instances was characterized by transitory attacks of dimness of vision with partial recovery between attacks. Vesical incontinence was present in four cases. There was no evidence that the incontinence was associated with attacks of petit mal, although this might be a possible explanation. Fatigue is common as a late manifestation but deserves special comment when occurring early. In three cases it was the first symptom complained of. The mode of production of mental symptoms occurring in cases of cerebral tumor is assumed to be direct or indirect interference with the function of the cortex and subcortical association fibers. Tumors extending deep into the substance of the frontal lobe and involving the corpus callosum are more likely to give severe mental symptoms than are tumors situated anteriorly or superficially in one frontal lobe. Due recognition must be given to increased intracranial pressure as one etiologic factor in any explanation of the presence of cerebellar signs in cases of tumor of the frontal lobe. It does not seem justifiable to attribute these signs solely to interference with the connections between the frontal cortex and the cerebellum. That such connections do exist has been demonstrated frequently, although recent experimental studies

of the projection systems from the frontal lobe bring to light some divergent results. Forced grasping was present in only one case of the series, but it was the one prominent localizing sign in the case.

### Florida Medical Association Journal, Jacksonville

24 305 362 (Dec.) 1937

- Carcinoma of Body of Uterus C Panettiere Miami Beach—p 319  
Breast Feeding with Especial Reference to Some of Its Problems  
L von Meysenbug Daytona Beach—p 322  
Acute Cranio cerebral Injuries J G Lyerly Jacksonville—p 326  
Endocrinology in Psychoneuroses W C McConnell St Petersburg—  
p 330  
Amebiasis W D Rogers Chattahoochee—p 333

### Journal Industrial Hygiene & Toxicology, Baltimore

19 513 614 (Dec.) 1937

- Investigation of Bacterial Contamination of Air of Textile Mills with  
Especial Reference to Influence of Artificial Humidification W F  
Wells and E C Riley, Boston—p 513  
Air Currents and Drafts as Factors in Air Conditioning D L MacLean  
and Ruth C Partridge Toronto—p 562  
Mechanical Device for Rapid Calculation of Cooling Power and Air  
Velocity from Kathethermometer Readings D F Vincent London  
England—p 571  
Studies on Phenothiazine II Continued Feeding of Phenothiazine.  
C W Eddy A J Cox and F DeEds San Francisco—p 574  
Range of Electrotor Meter Demonstrated by Darkfield Count S C  
Blacktin Leeds England—p 579  
Excretion of Silica in Urine After Oral Administration of Silica and  
Silicate Dusts and Solubility of Silica and Silicate Dusts in Acid  
and Alkaline Solutions at 37 C A G R Whitehouse London  
England—p 590  
Influence of Moderate Carbon Monoxide Poisoning on Ability to Drive  
Automobiles W H Forbes D B Dill H De Silva and F M  
Van Deventer Boston—p 598

### Journal-Lancet, Minneapolis

57 515 558 (Dec.) 1937

- Some of the Problems in Diagnosis of Intestinal Obstruction K E  
Darrow Fargo N D—p 518  
A Clinic on Disease of Biliary Tract. A M Snell Rochester Minn  
D L Kegaries and E W Minty Rapid City S D—p 522  
Ectopic Pregnancy E C Hanson Park Rapids Minn—p 527  
Tuberculin Tests in State 4 H Club Health Contestants M W  
Husband and D T Loy Manhattan Kan—p 529  
\*Present Day Status of Vitamins Review Marguerite Booth and A E  
Hansen Minneapolis—p 530

**Present Day Status of Vitamins**—With a gradual acceleration of knowledge beginning less than a half century ago, the whole subject of vitamins with its vast ramifications has been built up by means of chemical, biologic and clinical studies, until it has practically attained the status of an exact science. Booth and Hansen point out that not only is the chemical structure of many vitamins known exactly but recent investigators have developed chemical tests for determining quantitatively the amounts of various vitamins in the different tissues. Further developments along these lines may prove to be of far reaching importance. Of greater importance than the presence of florid avitaminosis is the occurrence of subclinical states of vitamin deficiency. This is particularly significant because of the interrelationships between vitamins and certain clinical disorders. The fact that knowledge concerning the nature of these deficiency diseases has advanced so definitely necessitates a more specific nomenclature regarding these conditions. Their review includes a history of all the vitamins, their standardization, the resultant pathologic changes when their individual ingestion is lacking or deficient the chief symptoms and laboratory diagnosis of the respective avitaminosis, their clinical application, daily requirements and their natural sources.

### Journal of Nervous and Mental Disease, New York

87 1132 (Jan.) 1938

- Emotional Factor in Skin Diseases E T Bernstein New York—p 1  
\*Further Experiences in Insulin Hypoglycemia Treatment of Schizophrenia.  
D E Cameron Worcester Mass—p 14  
Chronic Headache P A Draper Colorado Springs Colo—p 26  
Primary Melanomas of Leptomeninges Clinicopathologic Study with  
Review of Literature and Report of Additional Case M T Schmitter  
and D Ayer Boston—p 45  
Family with Sex Linked Hereditary Ataxia E V Turner Boston and  
E Roberts Urbana Ill—p 74

**Insulin-Hypoglycemia Treatment of Schizophrenia**—Cameron discusses certain of the reactions which occurred during the insulin treatment of schizophrenia in twenty patients. Fifteen of the group are considered "old cases, since the

schizophrenic symptoms have persisted for more than a year. The relation between the period of interruption and the subsequent behavior constitutes one of the major guiding principles of the insulin treatment. Not only the behavior prior to termination but also the depth of the reaction and perhaps the speed of termination have an influence on the succeeding behavior. The relationship between the posttreatment behavior and these three factors varies considerably from patient to patient but is relatively constant in a given case over periods to be reckoned in terms of weeks. Improvement is most frequently associated with interruption of treatment during any one of four fairly distinct phases. The first phase consists in a period of wakefulness, accessibility and relative clarity, which, with moderate doses, may appear between one and two hours after injection. The second phase consists in the biphasic (clonic) jerking. The third phase consists in the period during which the patient is beginning to enter coma. The fourth phase consists in deep coma in which the patient shows no response to auditory stimulation and in which the corneal reflex is gone. The phases in which the authors have empirically found it most expedient to terminate the reaction are the first and the fourth, the periods of most relative clarity and of deep coma. Importance attaches to the nature of improvement and to the nature of relapse. A further aspect of improvement that is of considerable interest is the concomitant increase of erotic activity. The concept of the "reversal of the psychosis" is considered erroneous. The phenomena so described are considered as arising from an interplay between the growing or lessening stability of the organism and varying degrees of intervals of tissue oxygenization. The author has not witnessed in his cases the high remission rates reported from European centers. Of his twenty subjects, three are able to be at home on a fairly stable basis and one patient, who had shown previous good remissions sometimes in apparent response to thyroid sometimes spontaneously, also showed a good remission after a few weeks of insulin treatment and could be discharged if suitable placement was available. Three others have been home on visits but are still on treatment. A further six are still on treatment and in the remaining seven treatment has been stopped, because of physical conditions or because the response was not sufficiently favorable to warrant further treatment.

### Journal of Pharmacology & Exper Therap, Baltimore

61 329 474 (Dec.) 1937

- Effect of Various Anesthetics and Certain Drugs on Electrocardiogram of the Dog C J Bellach Rochester Minn—p 329  
Effect of Strychnine on Irritability and Certain Other Properties of Perfused Frog Heart P L McLain Pittsburgh—p 338  
The In Vivo Effects of Eserine on Choline-Esterase System G W Manning J Lang and G E Hall Toronto—p 350  
\*Further Experiments on Effect of Certain Quinine Derivatives on Pneumococcus J M Johnston H B Burchell H H Permar and W W G MacLachlan Pittsburgh—p 364  
Synergism of Ethyl Alcohol and Sodium Pentobarbital J M Dille and R P Ahlquist Seattle—p 385  
\*Notes on Observed Effects of Prostigmine in Man Persons with Epilepsy L J Robinson Palmer Mass—p 393  
Distribution of Administered Iodide and Thiocyanate in Comparison with Chloride and Their Relation to Body Fluids G B Wallace and B B Brodie with assistance of M M Friedman and D Brand New York—p 397  
Distribution of Administered Iodide and Thiocyanate in Comparison with Chloride in Pathologic Tissues and Their Relation to Body Fluids G B Wallace and B B Brodie with assistance of M M Friedman and D Brand New York—p 412  
Respiratory Effects of Morphine Codeine and Related Substances VI Compounds Derived from Morphine and Dihydromorphine by Substitution in the 6-Carbon Position C I Wright and F A Barbour Ann Arbor Mich—p 422  
Id VII Compounds Derived from Codeine and Dihydrocodeine by Substitution in the 6-Carbon Position C I Wright and F A Barbour Ann Arbor Mich—p 440  
Specificity Relationships Between Types of Arsenicals and Types of Trypanosomes M L Kuhs and A L Tatum Madison Wis—p 451  
Effect of Anoxia on Action of Nitrous Oxide in Normal Human Subject J H Bennett and M H SeEVERS Madison Wis—p 459

**Effect of Quinine Derivatives on Pneumococcus**—Johnston and his associates present data which indicate that ethylapocupreine, hydroxyethylapocupreine and ethylhydrocupreine each possesses power to destroy pneumococci, regardless of type, in high dilution. The compound apocupreine showed also in test tube experiments, considerable power. Strains of pneumococci showed some variation in their susceptibility to these compounds. Occasional extremely resistant strains were

encountered, a few of which may have exhibited an acquired "fastness." However, the susceptibility of most strains fell within a reasonable range of concentration. The compound ethylapocuprene killed pneumococci in vitro in the highest dilutions, followed by ethylhydrocuprene, apocuprene and hydroxyethylapocuprene. Pneumococidal power appears in the serum of animals or of men who have received as little as 10 grains (0.65 Gm.) by mouth of ethylapocuprene or hydroxyethylapocuprene but did not appear after similar doses of apocuprene. Such pneumococidal activity appeared from within one and one-half to two hours after administration by mouth and persisted as long as the compound was given. Intramuscular injection gave a more prompt appearance of the substance in the serum, but the actual potency of such serum did not appear greater than when it was given by mouth. Intramuscular or subcutaneous administration cannot be used clinically because these substances give rise to local necrosis at the site of injection.

**Effects of Prostigmine in Epilepsy**—Robinson describes some of the manifestations of dimethyl carbamic ester of hydroxy phenyl-tri-methyl ammonium methyl sulfite, the physostigmine derivative (prostigmine) observed during the study of nine patients with epilepsy. With a 1 mg dose, one of six patients exhibited the effects of moderate peristalsis and sweating in the axillae, occurring half an hour after medication and disappearing in another half hour. Three patients received 2 mg. One showed no demonstrable reaction. In one patient muscular fibrillation and increased peristalsis developed twenty-five minutes after the drug was administered. These effects persisted for two hours and twenty-five minutes and were abolished at that time by atropine sulfate. Increased peristalsis developed in the last patient in half an hour after the compound was given, accompanied by projectile vomiting and faintness in one hour and twenty minutes. None of the patients exhibited any miosis or cardiovascular changes from the drug. The reactions did not differ from the manner in which normal men react to it.

### Journal of Thoracic Surgery, St. Louis

7 113 234 (Dec.) 1937

- Augmentation of Collateral Coronary Circulation by Operation. F. R. Mautz and C. S. Beck. Cleveland—p. 113.  
Tuberculous Pericarditis. A. Block and S. E. Levy. Nashville, Tenn.—p. 132.  
\*Chemotherapy in Treatment of Streptococcal Infections of Lung, Pleura and Chest Wall (Prontosil and Protargin). H. C. Ballou and A. Goldbloom. Montreal—p. 153.  
\*New Simplified Technique for Drainage of Lung Abscess Employing Graduated Trocars. O. H. Wangersten. Minneapolis—p. 181.  
Surgical Treatment in Sixteen Cases of Anterior Mediastinal Teratoid Tumors. One Complete Report of Case. S. W. Harrington, Rochester, Minn.—p. 191.  
Situs Inversus, Sinusitis, Bronchiectasis. Report of Five Cases Including Frequency Statistics. R. Adams and E. D. Churchill. Boston—p. 206.  
Cystic Disease of Lung. Cure of Solitary Cyst by Chemical Craterization. W. H. Field and L. Rosenberg. Brooklyn—p. 218.  
Cinefluorography of Today. W. H. Stewart. New York—p. 223.

**Chemotherapy in Treatment of Streptococcal Infections**—Experiences with prontosil and sulfanilamide in the treatment of four cases of infection of the lung, pleura or wall of the chest caused by the hemolytic streptococcus are recorded by Ballou and Goldbloom. These concern acute and chronic infections. In case 1 the lesions of the skin and bone constituted an unusual complication of scarlet fever. Pus collected in surgically inaccessible regions. The condition was chronic but uncomplicated by micro organisms other than the hemolytic streptococcus, which was obtained in pure culture. Numerous recognized therapeutic measures failed to halt the progress of the disease and to build up the patient's resistance. Sulfanilamide was employed daily for almost three months and a dramatic clinical response ensued. No ill effects resulted. In case 2, unresolved pneumonia complicated by a pleural effusion, prontosil and sulfanilamide were employed as a last resort with the result that the patient was remarkably improved and no longer occasioned any concern as regards life. Improvement was clinically manifested by a lessening of toxemia and a gradual resolution of the underlying pneumonic process, which may have been due to an indirect rather than to a direct action. In case 3 with a diagnosis of pneumonia with pleural effusion, at

the time treatment with prontosil and sulfanilamide was started the general condition of the patient was not good, the degree of toxemia was marked and signs were definite and extensive. The disappearance of toxemia following therapy was prompt. Changes in the physical signs, however, were gradual. The fourth patient was admitted because of a right sided pneumonia complicating pregnancy at the eighth month. The complaints referable to the respiratory system (dyspnea, pain in the chest and cyanosis) were all of less than thirty six hours' duration. The patient went into labor the next day and was delivered of a living female infant. The infant died three days later of a bilateral confluent bronchopneumonia. During a period of two weeks the following changes took place: physical signs referable to the right side of the chest became more extensive, the temperature remained slightly elevated, the left ear started discharging, the presence of a pleural effusion was confirmed, moderately thick purulent fluid was obtained, air replacement was performed, a rib resection and drainage of the empyema cavity were carried out under nitrous oxide anesthesia and the clinical course was satisfactory for ten days when the patient had difficulty in urination, a fever of 103 F and chilly sensations. Her pulse was of poor quality. She did not improve and so was given sulfanilamide every four hours while awake. This was continued for eight days. The next day she complained of a sore throat. Treatment with sulfanilamide was again started. Although the empyema cavity was not completely obliterated and still measured 70 cc., the patient was well enough to be permitted to be up and about in ten days. She was still receiving sulfanilamide. Complications developed about a week later. She was immediately given prontosil solution, 10 cc. intramuscularly every four hours, both by day and by night. She also received sulfanilamide orally, six tablets daily, and 10 cc. of the solution was instilled into the empyema cavity at each irrigation. A blood culture taken a few days later was reported negative. The temperature dropped to normal and prontosil therapy was discontinued on the forty-third day after its institution. When the patient was discharged from the hospital five days later a small empyema cavity still remained. The discharge from the empyema was always scanty when prontosil or sulfanilamide was given. The authors are of the opinion that treatment with prontosil and sulfanilamide should be kept up as long as significant signs and symptoms persist. The temperature curve does not serve as the only guide in this connection, particularly in the presence of an exudate.

**Technic for Drainage of Lung Abscess**—The hazard of draining a pulmonary abscess in the manner in which a soft tissue abscess is evacuated has been described. The difficulty with the cauterized or surgical diathermy method is that more lung tissue is destroyed than is necessary. It occurred to Wangersten that a series of graduated trocars with a knife-like edge would serve the purpose simply and satisfactorily, aided with the coagulation current of the surgical diathermy apparatus. The track of the aspirating needle into the abscess cavity could be followed by passing increasingly larger trocars over one another, applying the coagulating current in turn to each until a sufficiently large tunnel had been established to permit adequate drainage. Such a technic is outlined in detail. Use of this method has demonstrated that bloodless drainage of a pulmonary abscess, with minimal destruction of lung tissue, may be done quickly.

### Medical Annals of District of Columbia, Washington

6 337 370 (Dec.) 1937

- Chemotherapy of Certain Infections with Sulfanilamide and Related Compounds. S. M. Rosenthal, Washington—p. 337.  
Factors in Production and Treatment of Shock. Experimental Study. H. A. Davis. Memphis, Tenn.—p. 341.  
Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis. C. I. Cripe. Washington—p. 350.  
Washington's First Diabetic Camp for Children. S. Benjamin. H. H. Mishi and E. C. Rice. Washington—p. 354.  
Study of Temporary Use of Therapeutic Doses of Benzedrine Sulfate in 147 Supposedly Normal Young Men (Medical Students). H. P. Gwynn and W. M. Yater. Washington—p. 356.

**Benzedrine Sulfate**—To study the immediate effect of benzedrine sulfate in therapeutic doses, Gwynn and Yater gave half of 151 students 10 mg. benzedrine tablets after breakfast and after lunch for three days, the other half were given tablets of lactose. After a period of five days the preparation

tions were reversed, but the students were not informed that they were receiving other kinds of tablets. Altogether, 147 took the benzedrine tablets and all 151 took the lactose tablets. All 147 students who took the benzedrine tablets reported reactions of some kind from the use of the drug. Only sixteen of the 151 students who took the lactose reported reactions thought by them to be due to it. In answer to the specific question Did you feel fatigued, peppy or as usual? 113 stated that they felt peppy. In answer to questions as to any change in mood, seventy-two students reported that they became exhilarated. Forty-two students answered that they became more talkative. In answering the question as to the effect on concentration, sixty-one reported that they had an increased power of concentration while taking the drug and eight reported a decrease. In answer to the question Were you nervous? eighty-one stated that they were more nervous. Seventy-six students reported dryness of the throat in answer to the specific question. One hundred and twenty-six students suffered from insomnia and fifty-seven students reported decrease in appetite. Only thirty-eight students expressed a desire to continue using the drug, and 80 per cent of these qualified this answer by stating that they would like to use it at time of examinations and when it was necessary to stay awake. Hypertension, coronary arteriosclerosis and a state of manic excitement are definite contraindications to the use of the drug. The uses for which benzedrine has been advocated are as a local astringent, narcolepsy, persistent states of fatigue (nervous exhaustion), postencephalic parkinsonism, arterial hypotension, gastro-intestinal spasm, overdoses of barbiturates, preparation of individuals for periods of unusual mental or physical exertion, as an adjunct to the action of atropine, stramonium and scopolamine, and for attacks of migraine. It would appear that the use of the drug might be permitted or even prescribed for normal persons who suffer from lack of self confidence or mild depression and who deem it advisable to overcome these drawbacks temporarily. Similarly the drug might be permitted to persons who are required to engage in tests requiring mental alertness or perhaps competitive physical activities. The drug is only an emergency measure and after the emergency has passed an adequate period of rest must be available. The drug is apparently not conducive to habit formation. Although it is apparently not dangerous, it would appear that the dose of 20 mg a day is probably too much for the average normal person because of the insomnia and other unpleasant side effects observed.

### Minnesota Medicine, St Paul

20 755 822 (Dec) 1937

- Physiologic Mechanisms in Relation to Development of Peptic Ulcer  
F C Mann Rochester—p 755  
X-Ray Diagnosis of Ulcer R W Morse Minneapolis—p 762  
Peptic Ulcer Medical Management G B Eusterman Rochester—  
p 766  
Surgical Treatment of Peptic Ulcer D C Balfour Rochester—p 769  
Shall We Reduce Our Pneumonia Deaths? Lucy S Heathman O  
McDaniel and A J Chesley Minneapolis—p 775  
Diagnosis of Hyperthyroidism R A Johnson Minneapolis—p 781  
Surgical Treatment of Hyperthyroidism M Nordland Minneapolis—  
p 783  
X-Ray Treatment of Exophthalmic Goiter A M Smith Minneapolis  
—p 786  
Acute Appendicitis J F Norman Crookston—p 787

### Nebraska State Medical Journal, Lincoln

22 445 484 (Dec) 1937

- Diagnostic Interpretation of Jaundice C G Heyd New York—p 445  
Health Insurance in America M C Smith Curtis—p 449  
Low Back Pain Due to Herniation or Rupture of Intervertebral Disk  
into Spinal Canal F L Simonds Omaha—p 456  
Certain Vitamin Deficiency States Encountered in Practice J E  
Meyer Columbus—p 459  
Studies on Omaha Milk I Observations on Raw Milk J D Le Mar  
and M F Gunderson Omaha—p 465  
Report of Tuberculosis Survey in York County R E Harry York—  
p 468  
Brain Tumor Complicating Pregnancy M Emmert Omaha—p 471  
Radiosensitivity of Tumors J K Miller Ingleside—p 473

**Low Back Pain Due to Herniation of Intervertebral Disk**—Simonds believes that low back pain due to herniation or rupture of the intervertebral disk into the spinal canal is more common than is generally recognized. In the earlier cases the differential diagnosis lay between tumor and ruptured disk and all studies were made on patients showing marked

neurologic signs. As the work advanced, diagnosis has been possible in many cases in which pain was practically the only symptom. The chondromas, enchondromas, achondroses, traumatic ruptures of the intervertebral disk and so on undoubtedly represent a similar or identical pathologic process. The age in reported cases varies from 20 to 64 years and the incidence in men is about five to one over that in women. It has occurred in persons from all walks of life and a definite history of antecedent trauma was obtained in only 50 per cent of the cases. It seems reasonable to assume that the cause must be due to a jackknifing type of injury not sufficiently severe to crush a vertebral body, yet of great enough violence to injure the disk, with protrusion of a small piece into the spinal canal. Pain was the first symptom in every case. The pain was usually described as an ache in the lower part of the back, usually to one side or the other, becoming paroxysmal on turning, stooping, coughing or sneezing whereupon it would radiate outward over the buttock and down the back of the thigh and at times the back of the leg also. Not infrequently the pain commenced in the midline and radiated down the back of both thighs, but unilateral distribution was the rule. Numbness and paresthesias frequently alternated with pain or replaced it. Tenderness even on gentle percussion over the lower part of the spine, lumbosacral ligaments and sacroiliac joints was commonly present and on examination the lumbar muscles were found in protective spasm. The sole reflex abnormality noted in most cases is a loss of the achilles jerk on the affected side or of both sides in cases of bilateral involvement. Spinal fluid studies showed an increase of the protein content in many instances as the only significant change, and for the most part this was not excessive. The majority of cases resemble back strain, lumbosacral or sacroiliac strain or a sciatic neuritis. Hypertrophic arthritis was frequently a mistaken diagnosis. Routine x-ray examination with the aid of subarachnoid injection of iodized poppy-seed oil (5 cc) is the only method by which definite diagnosis may be made. The characteristic defect is produced by a mass ventral to the dural sac, to one side of the midline, and is usually seen best on the posterior-anterior or oblique views.

### New England Journal of Medicine, Boston

217 971 1016 (Dec 16) 1937

- Syphilis Looks at the Doctor N A Nelson Boston—p 971  
Significance of Positive Blood Test for Syphilis W A Hinton  
Boston—p 978  
Roentgenologic Manifestations of Syphilis G W Holmes and J R  
Lingley Boston—p 983  
The Early Diagnosis of Cardiovascular Syphilis P D White Boston  
and Nancy Bowman Wise, Durham N C—p 988  
Mapharsen in Treatment of Cardiovascular Syphilis Preliminary  
Report B Appel Boston—p 992  
Tuberculous Peritonitis in Children L D Van Antwerp, Meriden  
Conn—p 995

**Mapharsen in Treatment of Cardiovascular Syphilis**—Appel selected at random from the clinic at the Boston City Hospital twenty-eight men with cardiovascular syphilis who were treated with mapharsen. Their ages ranged from 38 to 67. All had positive blood tests. In sixteen cases the approximate interval between infection and the onset of cardiovascular symptoms could be determined with a fair degree of accuracy. It was twenty-two years in six Negroes and twenty-six years in ten white men. Antisyphilitic treatment prior to administration of mapharsen was as follows. Two had received no other treatment, five bismuth alone, five bismuth and bismarsen, eleven bismuth and nearsphenamine, four bismuth and tryparsamide and one bismuth, tryparsamide and nearsphenamine. Of the twelve who had previously received nearsphenamine, four had no reactions and none to mapharsen, six had various reactions and none to mapharsen and two had slight nausea with both. Not one of the twenty-eight patients treated had a nitritoid reaction. Twenty-one had no reactions to mapharsen. The clinical response to mapharsen is interesting. Omitting four patients who had less than six injections, there were twenty-four who received 280 doses. The size of the dose varied from 20 to 40 mg. Of these twenty-four patients, one had an attack of grip after the eighth treatment which kept him in bed several weeks and another patient with aortitis and a positive spinal fluid test, in whom visual blurring had developed during the administration of tryparsamide and a



questionable increase in blurring after six doses of mapharsen, felt that he was no better so far as his cardiac symptoms were concerned. The other twenty-two patients all felt a definite improvement in their condition following treatment. The two most striking results were improvement in dyspnea on exertion and a general tonic effect. Their appetites improved, the chest pains diminished and in some cases disappeared, the fatigability of the lower extremities diminished and in several cases the heart fluttering sensation improved. Several were able to sleep with only one pillow, having previously required two or more

### Ohio State Medical Journal, Columbus

34 1 128 (Jan) 1938

- Clinical Observations on Anemia of Children C R Rittershofer, Cincinnati —p 17  
Modern Conception of Eczema L E Seyler Dayton —p 23  
Considerations in Management of the 'Nervous Woman' A J Tronstein Newark —p 26  
Some Remarks on Laryngeal Diagnosis and Surgery H G Beatty Columbus —p 30  
Practical Method of Approach in Treatment and Prophylaxis of Allergic Diseases F Haufrecht Cleveland —p 34  
Results of Ten Years Experience with Various Solutions Used in Injection Treatment of Varicose Veins and Ulcers of Legs C H Verovitz Cleveland —p 37  
Systematic Outline Covering Diagnosis and Treatment of More Common Blood Dyscrasias L A Erf New York —p 47

### Pennsylvania Medical Journal, Harrisburg

41 177 260 (Dec) 1937

- Prevention and Treatment of Whooping Cough L Sauer Evanston Ill —p 177  
Behavior Problems in Children Definition, Classification and Scope F J Braceland Philadelphia —p 180  
Behavior Problems in Childhood Etiology E D Bond, Philadelphia —p 182  
Behavior Disorders in Children History and Examination K E Appel, Philadelphia —p 183  
The Organic Aspects of Behavior Disorders in Childhood H D Palmer Philadelphia —p 186  
Behavior Problems in Childhood Treatment Suggestions E A Strecker Philadelphia —p 192  
Crime and Communism H S McDewitt, Philadelphia —p 197

### Public Health Reports, Washington, D C

52 1851 1874 (Dec 17) 1937

- Note on the Preponderance of Cases with Bulbopontile Involvement in Small Outbreak of Poliomyelitis in Austin Texas A G Gilliam and G M Decherd —p 1853  
Medical Activities at the Boy Scout Jamboree Held in Washington, D C, June 30 to July 9, 1937 W L Smith —p 1854  
52 1875 1906 (Dec 24) 1937  
Effect of Addition of Dithioethylamine (Cystine Amine) to Diet of Albino Rat W H Schrell, R H Onstott D J Hunt and R D Lilie —p 1878  
Use of Pure Strain Animals in Studies on Natural Resistance to Transplantable Tumors H B Andervont —p 1885

52 1907 1966 (Dec 31) 1937

- \*Mortality from Rheumatic Heart Disease in Philadelphia During 1936 O F Hedley —p 1907  
The Family as a Unit for Nursing Service Helen Bean and Georgie S Brockett —p 1923  
Dibenzanthracene Tumors in Mice Production of Subcutaneous and Pulmonary Tumors by 1 2 5 6 Dibenzanthracene Adsorbed on Charcoal H B Andervont and E Lorenz —p 1931

**Mortality from Rheumatic Heart Disease**—Hedley assesses the mortality rate of rheumatic heart disease obtained through a response of practicing physicians, coroners and hospitals who reported 357 deaths from rheumatic heart disease, rheumatic fever, chorea and subacute bacterial endocarditis in Philadelphia during 1936, making a mortality rate of 17.6 per hundred thousand of population. In addition, 195 deaths regarded as presumably due to rheumatic heart disease were reported. Among the infectious diseases, rheumatic heart disease was exceeded as a cause of death by tuberculosis, lobar pneumonia and syphilis. Among the essentially chronic infectious diseases it ranked third, exceeded only by tuberculosis and syphilis. In persons less than 20 years of age, rheumatic heart disease was the cause of more deaths than pulmonary tuberculosis but fewer deaths than all forms of tuberculosis. Excluding pneumonia, bronchopneumonia, the diarrheas and enteritis of infancy, it was the second largest cause of death from infectious diseases. It resulted in more deaths in persons less than 20 years of age than whooping cough, measles, meningococcic

meningitis, diphtheria, scarlet fever and anterior poliomyelitis combined. These diseases followed rheumatic heart disease in the order mentioned. While rheumatic heart disease probably does not result in more deaths than all these diseases, during years in which epidemics of one or more of them occur, there is little doubt that over a course of years it is the cause of more deaths than any one of them. The mean age at death was 36.5 years. Both in the number of deaths and in the death rate per hundred thousand of population, females slightly exceeded the males. A plea is made for increased recognition of the importance of rheumatic heart disease by health officials, for improved reporting and recording of deaths from this cause, and for greater cooperation among various agencies that may contribute to its study.

### Puerto Rico J Pub Health & Trop Med, San Juan

13 171 350 (Dec) 1937

- Studies on Schistosomiasis Mansonii in Puerto Rico V Clinical Aspects of Schistosomiasis Mansonii in Puerto Rico J A Pons San Juan —p 171

### Rhode Island Medical Journal, Providence

21 1 20 (Jan) 1938

- Individualized Treatment of Diabetes J P Peters, New Haven Conn —p 1  
The Use and Abuse of Insulin P H Lavietes New Haven Conn —p 5

### Southwestern Medicine, Phoenix, Ariz

21 425 472 (Dec) 1937

- Improved Medical Care An Argument Against State Medicine C R Swackhamer, Superior Ariz —p 425  
\*New Conception of Bronchiectasis Preliminary Report S H Watson and C S Kibler Tucson, Ariz —p 428  
Geographic Origin of Tuberculosis in a Private Practice in Arizona H Randolph Phoenix Ariz —p 431  
Treatment of Acute Appendicitis T G Orr, Kansas City Kan —p 433  
Respiratory Infections in Children J A Schoonover Denver —p 438  
Further Proof of Nonpassive Expiration Theory to Explain Asthma O H Brown Phoenix Ariz —p 442  
Chemical Disease O H Brown Phoenix Ariz —p 443  
The Food Addition Method of Diet O H Brown Phoenix, Ariz —p 444

**Bronchiectasis and Allergy**—Watson and Kibler point out that bronchiectasis is seldom found without at least some evidence of sinusitis. They observed that many cases of bronchiectasis had some manifestation of allergy (hay fever, asthma, urticaria, eczema or rhinitis). Investigating the cytology of the nasal secretions, they were impressed with the frequency of high percentages of eosinophils. They then began cytologic examinations of the sputum in all bronchiectatic cases and found an abundance of eosinophils in a large proportion. Since that time they have seldom failed to find an abnormal percentage of eosinophils in the sputum if repeated examinations were performed. The observation that the large majority of bronchiectatic cases present abnormal percentages of eosinophils in the sputum gives the impression that bronchiectasis has an allergic background. The question arises as to whether sinusitis and bronchiectasis in a patient have a common etiology, allergy. Cutaneous tests and history taking have largely confirmed this. Other evidence that they believe supports their hypothesis is that many cases of bronchiectasis respond to elimination of allergens or to desensitization treatment with offending substances with marked reduction of cough and sputum, or with even entire elimination of symptoms if the case is not too far advanced. The authors give a new etiologic classification of bronchiectasis: congenital, similar to congenital cystic disease of the lung, mechanical, due to pulmonary fibrosis, particularly associated with fibrous pleuritis, allergic, the result of hypersensitivity. Of the three types the allergic is by far the most important, probably comprising about 90 per cent of the cases coming to the physician's attention. The explanation why allergic bronchitis predisposes to bronchiectasis is that swelling of bronchial mucosa and exudation of tenacious secretion interfere with efficient pulmonary drainage and, favored by coughing, the chronic infection which results gradually weakens the wall of the bronchial tree. Bronchiectasis usually occurs in the most dependent portion of the lung, the posterior half. This location is the most unfavorable point of drainage.



## Surgery, Gynecology and Obstetrics, Chicago

65 721 854 (Dec) 1937

- Primary Point of Infection in Tuberculosis of the Hip Joint C H Hatcher and D B Phemister Chicago—p 721
- \*Blood Volume Changes During Surgical Procedures J G Gibson 2d and C D Branch Boston—p 741
- Hepatic Lesions of the New Born A S Price New York—p 748
- Acute Osteomyelitis of Upper End of Femur R Jones Jr and L Roberts Durham N C—p 753
- Some Surgical Aspects of Tuberculous Disease of Abdominal Lymphatic Glands G H Colt London England and G N Clark Alexandria Egypt—p 771
- Cancer of the Breast C C Lund Boston—p 788
- Five Year End Results in Treatment of Cancer of Tongue Lip and Cheek H E Martin New York—p 793
- \*Ileocecal Lymphadenitis in Children A E Brown Colac Victoria Australia—p 798
- The Greenough Technic of Radical Mastectomy G W Taylor and E M Daland Boston—p 807
- Double Pulley Traction in Treatment of Humeral Shaft Fractures L Blum New York—p 812
- Uterine Curettage as an Aid in Diagnosis of Ectopic Pregnancy R S Siddall and C Jarvis Detroit—p 820
- Posterior Gastrojejunostomy Unusual Error in Technic J M McCaughan and W T Coughlin, St Louis—p 824
- Nephrectomy versus Conservative Operation in Unilateral Calculous Disease of Upper Urinary Tract G D Oppenheimer, New York—p 829
- Indications for Vaginal Hysterectomy H D Cogswell Tyler Texas—p 837

### Blood Volume Changes During Surgical Procedures

Gibson and Branch discuss the results of studies on twelve patients in whom the changes in the blood volume were determined during the actual surgical procedure and during the recovery period. Plasma, cell and total blood volume were determined by the dye method described by Gibson and Evans. Four patients were studied during nitrous oxide-oxygen induction and ether anesthesia, two during tribrom-ethanol induction and ether anesthesia, one during local regional anesthesia with procaine hydrochloride and one during spinal anesthesia with procaine hydrochloride. In every case the induction of anesthesia was accompanied by a slight but definite decrease in the plasma volume. The diminution in plasma volume is temporally related to elevation of blood pressure and pulse and respiratory rates. In two patients in whom anesthesia was induced with tribrom ethanol, no change in blood pressure occurred and the plasma volume was but slightly reduced. Following the administration of ether, no change in pressure or volume occurred in one case, but in the other case a sharp rise in pressure took place, accompanied by a definite decrease in plasma volume. In another case a considerable elevation in blood pressure occurred during gas-oxygen and ether induction of anesthesia, accompanied by a striking decrease in plasma volume. In one case basal blood pressure was elevated, gas-oxygen ether induction was accompanied by an initial further rise and subsequent fall in pressure, and plasma volume remained fairly constant. In one patient who was operated on under local procaine hydrochloride anesthesia, infiltration was followed by a sharp rise in pressure, and the plasma volume was diminished. Variable fluctuations in cell volume occurred. In the four patients anesthetized with gas oxygen and ether it increased in one and was slightly reduced in three. An increase occurred in the two cases in which tribrom ethanol was used, while in the two cases in which procaine hydrochloride was used a decrease took place. Thus the cell volume was diminished in four and increased in four of these patients. Yet in all but one case the hematocrit value rose with the induction of anesthesia, indicating a slight hemoconcentration. As regards total volume the degree of reduction therein, owing chiefly to loss of fluid from the blood stream, parallels the degree of elevation of blood pressure. During operation, fluctuations in the blood volume level vary with fluctuations in arterial tension, a rise in systolic pressure being accompanied by a fall in plasma volume and vice versa. The total volume is reduced at the end of operation, the reduction being due to a diminution of plasma volume, larger than can be offset by influx of red cells into the circulation.

**Ileocecal Lymphadenitis in Children.**—Brown avers that it is generally recognized that there exists in children and young adolescents an acute abdominal condition in which the symptoms are similar to those of appendicitis but in which the predominant observations at operation, and presumably the principal pathologic basis consist only of an inflammatory enlargement

of the mesenteric and retroperitoneal lymph glands draining from the ileocecal angle. The condition is common, and owing to its resemblance to appendicitis most cases come under the direct observation of surgeons. Nearly always the preoperative diagnosis is appendicitis. The author's experience with cases of ileocecal adenitis teaches him that with care and a knowledge of the condition a correct preoperative diagnosis is possible in at least a reasonable proportion of cases. The general picture of such a case is as follows. The patient is between the ages of 3 and 18 years. He is seized with abdominal pain, which is of varying severity and can generally be traced to the right side of the lower part of the abdomen. During the attack there is evidence of definite toxicity. The attacks subside as a rule, and the child has intervals of weeks or months during which he is apparently well, but the attacks recur and will continue to recur until the operation of appendicectomy is performed, after which he will be free from symptoms.

## Virginia Medical Monthly, Richmond

65 162 (Jan) 1938

- Science in the Old Dominion A H Clark Washington D C—p 1
- Is Socialized Medicine the Next Step? H W Potter Newport News—p 11
- Premature Separation of Placenta Study of Fifty Six Cases Occurring at the Medical College of Virginia Hospitals C L Riley, Richmond—p 14
- Primary Mastoiditis Report of Case C P Jones, Newport News—p 16
- Primary Carcinoma of Lung Report of Five Cases at U S Marine Hospital Norfolk Virginia G H Faget and O Harmos Norfolk—p 18
- Treatment of Hay Fever by Ionization Case Reports S M Cottrell, Richmond—p 24
- Management of Inoperable Carcinomas J A Gannon Washington, D C—p 28
- Early Adventures in Public Health in Virginia R K Flannagan, Richmond—p 30
- Stab Wound of the Heart with Cardiac Tamponade Report of Case G G Oswalt Mobile Ala and A Abramson Alexandria—p 35
- Rheumatic Heart Disease R B Grinnan Jr Norfolk—p 37
- Conservative Treatment of Pelvic Inflammation Preliminary Report on Elliott Therapy R H Hoge Richmond—p 42
- Stab Wounds of Gallbladder Case Report W M Junkin Fredericksburg—p 44
- Method of Transfusion for Infants P Hogg Newport News—p 46
- The Doctors' Participation in the Health Program V L Ellicott, Rockville Md—p 47

## West Virginia Medical Journal, Charleston

33 533 580 (Dec) 1937

- New Names for Old Tumors L A Pomeroy Cleveland—p 533
- A Plea for Early Diagnosis of Malignancy J E Wilson Clarksburg—p 537
- Early Tuberculosis A A Tombaugh McConelsville Ohio—p 540
- Treatment of Acute Pneumococcal Empyema with Especial Reference to Early Drainage W L Cooke Charleston—p 543
- Delayed Union and Pseudarthrosis J C Pickett Morgantown—p 547
- Typhoid Fever with Associated Pneumococcal Pneumonia and Aplastic Anemia Case Report A R K Matthews and H L Browne, Parkersburg—p 553
- \*Treatment of Pyelitis with Sulfanilamide Case Reports A J Villani, Welch—p 557
- Alum Precipitated (One Dose) Toxoid Study of Permanency of Immunity A M Price Charleston and J L Blanton Fairmont—p 560
- The Use of Diuretics in Edema R J Snider, Wheeling—p 562

**Treatment of Pyelitis with Sulfanilamide.**—Villani reports seven consecutive cases of pyelitis in which he believes that sulfanilamide therapy produced definite therapeutic results. Two of the patients are children with acute infection, one of whom according to the family physician failed to respond to methenamine and alkali therapy. Three cases of chronic infection and two cases of postoperative infection promptly cleared up with the institution of sulfanilamide therapy when other forms of treatment had failed. Cyanosis developed in one patient, which promptly disappeared with the cessation of the drug. The drug was just as effective in a urine of acid reaction as it was in a urine of alkaline reaction.

## Wisconsin Medical Journal, Madison

37 184 (Jan) 1938

- Treatment of Pruritus Ani A A Hill and R L McIntosh Madison—p 17
- Tetanus Toxoid Active Immunization Against Tetanus M Fernan Nunez Milwaukee—p 21
- Recent Advances in Psychiatric Therapy Annette C Washburne Madison—p 25
- Psychologic Factors in Disease W C Menninger Topeka Kan—p 29
- Fluid Requirements F Raine Milwaukee—p 38

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Physical Medicine, London**

12 167 188 (Dec) 1937

- Present Position with Regard to Biologic Effects of High Frequency Currents L. Hill and H. J. Taylor—p 168  
Experimental Proof of Specific Effects of Low Intensity Short Waves on Living Tissues P. P. Dalton—p 170  
Bee Venom Therapy in Chronic Rheumatic Disorders J. B. Burt—p 171  
Some Observations on Orthopedics and Physical Medicine A. M. A. Moore—p 173

**British Medical Journal, London**

2 1153 1206 (Dec 11) 1937

- Autophytic Dermatitis H. MacCormac—p 1153  
\*Sulfanilamide in Treatment of Erysipelas. Controlled Series of 270 Cases W. R. Snodgrass and T. Anderson—p 1156  
Parabenzyaminobenzenesulfonamide in Treatment of Scarlet Fever J. C. Hogarth—p 1160  
\*Occurrence of Subclinical Trichinosis in Britain. Results from 200 London Necropsies V. D. van Someren—p 1162  
Prevalence of Middle Ear Disease in Elementary School Children. Otoloscopy as an Adjunct to Routine Medical Inspection F. J. G. Lishman—p 1165

**Sulfanilamide in Treatment of Erysipelas**—Snodgrass and Anderson observed the value of sulfanilamide in the treatment of 135 cases of erysipelas as compared to ultraviolet irradiation in the same number of cases. A decidedly more favorable result as regards cessation of spread was evident in those cases in which sulfanilamide was administered. The cases which showed no spread of the lesion after the end of the first day are ultraviolet 59 per cent, sulfanilamide 96.9 per cent. After two days in the hospital the lesion continued to spread in only 0.77 per cent of cases in which sulfanilamide was administered, but with ultraviolet irradiation the lesion continued to spread in 27.1 per cent. A more favorable result as regards duration of pyrexia was also observed in the cases in which sulfanilamide was administered. After the cases in which there was no pyrexia are deducted, the percentages of those in which there was no fever after forty-eight hours of treatment are ultraviolet 47.3 per cent and sulfanilamide 75.2 per cent. Pyrexia continued for more than three days in only 9.6 per cent of cases in which sulfanilamide was administered, but the equivalent percentage was 40 in those in which ultraviolet irradiation was employed. Also there was a slightly more favorable outcome as regards duration of toxemia in the cases in which sulfanilamide was administered. Those free from signs of toxemia at the end of forty-eight hours of treatment were ultraviolet light 37.9 and sulfanilamide 46.9 per cent. After three days in the hospital 23.47 per cent of all patients receiving sulfanilamide remained toxic, the equivalent percentage with ultraviolet irradiation was 43.3. The administration of sulfanilamide reduced the incidence of complications and diminished the tendency to recurrence. An effective method of treatment is to give 1 Gm of sulfanilamide by mouth at intervals of four hours until the primary pyrexia ceases and thereafter 0.75 Gm three times a day until final cure is obtained.

**Subclinical Trichinosis in Britain**—Van Someren reviews the published records of trichinosis in the British Isles, but in view of the atypical syndrome apparently associated with many cases and the difficulties still attendant on diagnosis (Hall, 1937) it is not surprising that the disease is recognized during life only in epidemic proportions or in those few cases showing classic symptoms. Since trichinosis may be acquired by persons who never show any symptoms of the disease it is obvious that the incidence indicated by diagnosis during life is no criterion of the frequency or degree of exposure to infection. A study of the frequency of subclinical infections is therefore necessary to estimate the true risk of infection, and pending improved diagnostic methods such a study can only be carried out at necropsy. The incidence of trichinosis in London was estimated by digestion of diaphragms from 200 cadavers and examination of the sediment of the digest for larvae. The diaphragms examined were from all age groups, from stillbirths to old age, covering a fairly representative selection of population classes and districts in and about London. Only two out of the 200 diaphragms examined showed infection with *trichinella* giving an indicated incidence of 1 per cent. In

both cases the infection was slight—one larva per gram of muscle. In neither instance had there ever been any symptoms suggestive of trichinosis. Neither patient had ever been abroad, indicating that the infections were endemic. The scarcity of previous records and the present observation of an incidence of 1 per cent indicate that trichinosis is uncommon in Great Britain. The system of rearing pigs in Great Britain is such that swine can have little chance of acting as infective bearers of trichinosis, but imported bacon may form a slight source of infection. The general level of hygiene and habits of the British peoples probably is the principal part in reducing the risk of infection.

**Journal of Pathology and Bacteriology, Edinburgh**

45 477 796 (Nov) 1937

- Studies on Tissue Culture of Intracranial Tumors L. B. Cox and Marie L. Cranage—p 477  
Wet Film Technique in Histologic Diagnosis of Intracranial Tumors. Rapid Method Dorothy S. Russell, H. Krayenbuhl and H. Cairns—p 501  
Embryology of Parathyroid Glands. Thymus and Certain Associated Rudiments J. R. Gilmour—p 507  
Listerella in Human Meningitis R. A. Webb and Mary Barber—p 523  
Some Factors Which Influence Reduction in Broth and Their Bearing on the Growth of *Clostridium Tetani* R. A. Q. O'Meara—p 541  
Method for Alcohol Check Experiments with Closed Circuit Apparatus Used in Respiratory Metabolism J. F. Barrett and J. D. Robertson—p 555  
\*Red Cell Characteristics in Acholuric Jaundice Janet M. Vaughan—p 561  
Hyperplasia of Bone Marrow Associated with Dissemination of Malignant Neoplasms. Observations on Tumor Bearing Rabbits Guinea Pigs Rats and Mice J. W. Orr—p 579  
The Histopathology of Fowl Pest G. M. Findlay R. D. Mackenzie and Ruby O. Stern—p 589  
Apical Scurs and Their Relationship to Siliceous Dust Accumulation in Nonsilicotic Lungs J. Davson and W. Susman—p 597  
\*Tuberculosis of Central Nervous System with Especial Reference to Tuberculous Meningitis A. R. Macgregor and C. A. Green—p 613  
Experimental Tuberculosis of the Eye W. A. Gray—p 647  
Ketene as a Noxious Gas C. R. Cameron and A. Neuberger—p 653  
Influence of Tissue Permeability on Local Immunity G. Favilli and D. McClean—p 661  
Bisexual and Cooperative Properties of Sex Hormones as Shown by Histologic Investigation of Sex Organs of Female Rats Treated with These Hormones V. Korenchewsky and Kathleen Hall—p 681  
Carcinogenic Action of Estrone. Induction of Mammary Carcinoma in Female Mice of Strain Refractory to Spontaneous Development of Mammary Tumors G. M. Bonser, L. H. Stickland and K. I. Connal—p 709  
Preparation of Toxin of *Haemophilus Pertussis*. Its Properties and Relation to Immunity D. G. Evans and H. B. Matland—p 715  
Effect of Serum on Colonial Form of *Corynebacterium Diphtheriae* R. Knox—p 733  
Experimental Transmission of Rat Leprosy to Golden Hamster (*Cricetus Auratus*) S. E. B. Balfour Jones—p 739  
Reaction of Isamine Blue with Serum H. R. Dean—p 745  
Influence of Hemoglobin and Ferrous Ammonium Sulfate on Growth of *Tubercle Bacillus* R. Davies—p 773

**Red Cell Characteristics in Acholuric Jaundice**—Vaughan studied the character of the red cells in a series of cases of acholuric jaundice before and after splenectomy. As a result of the observations made, further problems arose affecting the possible relationship of the shape of the cells to the fragility of the cells. Increased fragility of the red cells in sodium chloride solutions was found in thirty-five cases of acholuric jaundice and increased spherocytosis in twenty-five of twenty-seven cases examined. Megalospherocytosis as well as microspherocytosis may occur in acholuric jaundice. Following splenectomy, increased fragility invariably persisted, spherocytosis was lost in 50 per cent of the patients. It is suggested that both erythropoiesis and splenic function are at fault in this disease. A high degree of correlation was found between mean corpuscular thickness and median corpuscular fragility, both in acholuric jaundice and in other conditions before splenectomy. Since fragility remained abnormal after splenectomy while spherocytosis returned to normal, it is concluded that increased spherocytosis is not the fundamental abnormality present in the acholuric red cell.

**Tuberculosis of Central Nervous System**—Macgregor and Green declare that the ideal method for the isolation of tubercle bacilli from the cerebrospinal fluid is the utilization of both direct culture and guinea pig inoculation. If direct culture is adopted, Lowenstein-Jensen medium is likely to be of more service than the routine mediums used more commonly. In a series of eighty cases of tuberculous meningitis the infecting organism was found to be of the human type in 76 per cent and of the bovine type in 24 per cent. Of these cases 2 per cent occurred in the first six months of life, 14 per cent in

the first year and 81 per cent within the first decade. The human type of organism was responsible for 91 per cent of primary thoracic cases terminating in tuberculous meningitis, the bovine type for 9 per cent. By contrast, the two types were responsible for approximately equal numbers of cases terminating in meningitis with an initial focus of infection in the abdomen. It was reasonably certain that the exudative meningitis had arisen from a localized lesion. In one case the responsible lesion was in the spine, in the rest it was in the brain or meninges. The localized lesions in the central nervous system took the form of caseous nodules in the substance of the brain and cord, tubercles or deposits of tuberculous exudate in the meninges or choroid plexus and areas of tuberculous meningo-encephalitis. Twenty-five cases of tuberculosis without meningitis were examined for evidence of infection of the central nervous system. In eleven of twenty-four brains, localized tuberculous lesions were found. In ten of twenty cerebrospinal fluids, tubercle bacilli were demonstrated. Cerebrospinal fluids from forty-five patients who presented symptoms of cerebral or meningeal irritation and who reacted to the tuberculin cutaneous test were examined for tubercle bacilli and other evidence of tuberculous infection. In three cases tubercle bacilli were isolated and in two others the cerebrospinal fluid showed cytologic changes strongly suggestive of tuberculous infection. In no case did fatal tuberculous meningitis develop.

### Journal of Physiology, London

91 233 364 (Dec 14) 1937

- Observations on Inactivation of Adrenalin by Blood and Tissues in Vitro W A Bain W E Gaunt and S F Suffolk —p 233  
Mechanism of Pitch Change in the Voice R Curry —p 254  
Effect of Anaerobic Activity and Rest on Efficiency of Contraction in Isolated Frog Muscle M Cattell and H Feit —p 259  
Red Cell Count of Macaques in Relation to Menstrual Cycle A N Guthkelch and S Zuckerman —p 269  
Acclimatization of Mice to Atmospheres Containing Low Concentrations of Carbon Monoxide Esther M Killick —p 279  
After Positivity of Stimulated Nerve and Its Relation to First Phase of Recovery Heat Production J L Parkinson —p 293  
Transmission of Impulses Through Inferior Mesenteric Ganglions D P C Lloyd —p 296  
Changes in Creatine Phosphagen and Adenylpyrophosphate in Relation to Gaseous Metabolism of the Heart W Burns and E W H Cruickshank —p 314  
Movements in Midfetal Life in the Sheep Embryo J Barcroft and D H Barron —p 329  
Pancreotropic Action of Anterior Pituitary Extracts K C Richardson and F G Young —p 352

### Lancet, London

2 1353 1412 (Dec 11) 1937

- Observations on Life History of Chronic Peptic Ulcer D T Davies and A T M Wilson —p 1353  
New Trypanocidal Substances H King E M Lounie and W Yorke —p 1360  
Inadequacy of Synthetic Ascorbic Acid as an Antiscorbutic Agent A Elmh and E Warburg —p 1363  
Sternal Puncture in Pernicious and Achrestic Anemia A T Zanaty —p 1365  
Sugar Tolerance Test of Fenton and Rose C J Young with technical assistance of H Bolland —p 1367  
Lumbar Puncture Pressures in Subarachnoid Hemorrhage R Kemp —p 1369

**New Trypanocidal Substances**—Prompted by the discovery that synthalin has a direct trypanocidal action, King and his colleagues prepared a considerable number of guanidines, isothioureas, amidines and amines, with alkyl and alkylene chains and examined them for trypanocidal activity. It was found that certain of the diamidines exhibit a powerful trypanocidal action in vitro. With the most active member of the series, undecane diamidine, it is possible to produce permanent cures in infected laboratory animals. As undecane diamidine is of entirely different chemical constitution from all known trypanocidal substances this discovery is of considerable academic interest. Its value is increased by the fact that resistance to the drug is acquired by the trypanosome slowly, if at all and that trypanosomes which have been made completely resistant to the aromatic arsenicals exhibit no resistance to this compound.

**Inadequacy of Synthetic Cevitamic Acid**—Elmh and Warburg have recently observed that some patients presenting typical prescorbutic and scorbutic conditions have not reacted to the administration of synthetic cevitamic acid in the manner

that would be expected if this acid and vitamin C were identical. Of twenty-nine patients found to present signs of hemorrhagic diathesis together with a low concentration of cevitamic acid in the serum, each was given 300 mg of cevitamic acid daily by mouth for ten days. In all but three this led to disappearance of the tendency to hemorrhage and a return of the serum cevitamic acid to normal. The three patients differed from the others in that the hemorrhagic condition was not cured and that the serum cevitamic acid was not increased by the oral administration of cevitamic acid. They were given an additional 300 mg of cevitamic acid intravenously every day for ten days. But even then the hemorrhagic condition was not abolished, nor was the serum cevitamic acid brought up to normal. After these three patients had taken a total of 6 Gm of cevitamic acid, they were given the juice of ten lemons every day for ten days. With this change in treatment the hemorrhagic condition disappeared and the serum cevitamic acid returned to normal. The explanation that the authors suggest is that for the absorption and retention of cevitamic acid some unknown substance (a co-vitamin) is required. This substance is present in lemons. This unknown factor either may be part of some other foodstuff or may be produced in the intestine under normal conditions. The hypothesis that this factor is the same as the P vitamin found by Szent Gyorgyi is being investigated.

### Medical Journal of Australia, Sydney

2 979 1018 (Dec 4) 1937

- Medicine in the Union of Soviet Socialist Republics A Jacobs —p 979  
Esophageal Carcinoma G Halloran —p 983  
Malignant Disease of Esophagus J G Edwards —p 987  
Radiational Treatment of Esophageal Carcinoma C de Monchaux —p 989  
Observations on Comparative Anatomy of Blood B Bradley —p 992  
Blood Pressure in the Australian Aboriginal with Consideration of Possible Etiologic Factors in Hypertension and Its Relation to Civilization L J J Nye —p 1000

### Japanese Journal of Gastroenterology, Kyoto

9 163 262 (Sept) 1937

- Statistical Observation of 342 Inpatients in Matsuo Medical Clinic Suffering from Gastric and Duodenal Ulcers T Kosaki —p 163  
Behavior of Liver to Metabolism of Amino Acids I Kitamura —p 166  
Existence of Substance in Blood Which Promotes Detoxicating Function of Liver During Renal Disturbance K Murakami —p 184  
\*Localized Pain Point of Gastric and Duodenal Ulcer I Matsuo and T Kosaki —p 193  
Studies on Rhodan Formation During Abnormal State of Liver Functions Reports I and II N Fujiwara —p 199  
Supplementary Information on Influence of Phosphorus on Liver Functions N Fujiwara —p 250  
Existence of Substance Promoting Liver Functions in Bile Further Findings in Enterohepatic Circulation of Bile N Mizuta and Y Ikegami —p 258

**Localized Pain in Gastric and Duodenal Ulcer**—Matsuo and Kosaki believe that in the palpation of gastric and duodenal ulcer localized areas of pain can be classified into four groups. They outline their observation on 148 inpatients whose diagnosis was ascertained by x-ray examination and operation. The palpation was accomplished by placing patients on their backs after fasting and in such a position that the abdominal wall is relaxed while the knee is bent or stretched as the patient breathes quietly. No power should be applied to the tip of the fingers, and the palpation is performed rather passively. Pain, especially the localized point, is discovered by the palpation. The point of pain is marked and confirmed by x-ray examination or by operation. 1 When gastric, a callous ulcer can be felt in the right middle, central and left middle regions and in duodenal ulcer in the mid lower and right lower regions. 2 Simple ulcer can be usually felt as it is movable by respiration and body movement, possibly because of the constriction of the wall and the perigastric infiltration. In duodenal ulcer nothing is felt in the left region. 3 Localized swellings of lymph glands are separated from the ulcer and diminish with the disappearance of the ulcer. At operation, the swollen lymph gland is ascertained to correspond to the tumor. In gastric ulcer the swollen lymph gland is felt in the middle upper and central regions. In duodenal ulcer it is felt in the right middle region. 4 In some cases a localized area of pain can be determined but no tumor can be felt. Mere localized pain is seen in 29.1 per cent of all cases, callous ulcer can be felt as tumor in 9.2 per cent, simple ulcer in 49.6 per cent and localized swelling of lymph gland in 8.4 per cent can be felt as a tumor.

## Journal de Medecine de Lyon

18 679 708 (Dec 20) 1937

Study of Structure of Connective Tissue Formation in Scleroses M Favre and J I Martin—p 679

\*Infarctogenic Pulmonary Syphilis M Favre J Dechaume P Croizat and J Flamet—p 687

**Infarctogenic Pulmonary Syphilis**—Favre and his associates point out that there are autochthonous infarcts of arterial origin. Clinically the latter assumes the mask of an asystole with perceptible pulmonary manifestations in which the painful symptoms, due to infarcts, may dominate the picture. It may be unrecognized under these strange clinical aspects, it is the presence of other signs of visceral or nervous syphilis which may direct the diagnosis. This type of pulmonary syphilis is differentiable from more clear-cut clinical types: dilatation of the bronchi and Ayerza's syphilitic disease. The necropsy reveals multiple infarcts of different ages, disseminated in the two lungs within a changed parenchyma, in which already appear the thrombosing lesions of the vascular system. The microscopic examination shows (1) infarcts that are associated with necrosis and hemorrhage but in a parenchyma already impaired before infarction, (2) the lesions of pulmonary syphilis, (3) the vascular lesions, which are prominent on account of their dissemination in the entire lung, of their generalization in the entire circulatory, pulmonary and bronchial systems, in the whole vascular system—arteries, veins, capillaries—and of their intensity and the presence of multiple vascular thromboses, (4) a veritable hilitis, produced at the level of the hilus by these vascular alterations, resulting in considerable nervous and bronchial changes. In this form of pulmonary syphilis, the vascular lesions seem to be the oldest and demonstrate that local thrombosis, due to syphilitic vascularitis as well as embolism, is infarctogenous. In the fine mechanism which associates necrosis and hemorrhage there intervened also (1) circulatory disorders due to multiple lesions of the entire vascular system and (2) disturbances in the vasomotor reflexes, which originate in a changed neurosympathetic system at the level of the hilus. These considerations may be applied to other visceral infarcts. A knowledge of this infarctogenic form permits the comparison of infarcts and gummas and demonstrates again the great importance of vascular defects in the genesis of pulmonary syphilis.

## Revue de la Tuberculose, Paris

3 993 1120 (Nov.) 1937 Partial Index

\*Distribution of Elasticity in Interior of Lungs Physiologic Explanation of Localization of Pulmonary Tuberculosis in Adults M Baillet—p 994

Why Is There a Subatmospheric Pressure Between Two Pleuras? O Cantoni—p 1020

Study on Primary Tuberculous Infection Among Population of Rural Schools H Van Den Eckhout—p 1029

Resection of Pleural Adhesions in Open Operation Cured Case G Derscheid and P Toussaint—p 1040

Pulmonary Sclerosis with Double Pneumothorax in a Mold Maker C Roubier—p 1047

Questionnaires of Admission to Sanatorium E Rist—p 1059

**Localization of Pulmonary Tuberculosis**—Baillet demonstrates that the lung should be considered as formed of two distinct parts with different elasticity. First there is the antero-superior lobe, the extensibility of which is extremely great and the tissue of which is extremely fragile, then there is the postero-inferior, which is less extensible and more resistant. Under normal conditions the superior lobe undergoes a greater extension than the inferior lobe to maintain its contact with the thorax, on account of its greater extensibility. This does not imply that it is subjected to a greater tension. When in the course of an artificial pneumothorax the lung becomes separated from the thorax, the superior lobe likewise proves highly retractile. No experimental verification permits the affirmation that the tensions to which the lung is subjected in the state of rest to preserve contact with the thorax are unequally distributed at its surface and in its mass. In the dynamics of respiratory expansion the inspiratory traction spreads from the mobile regions (sternal and diaphragmatic) to the immobile regions of the posterosuperior part. Under these conditions, contrary to the discussed hypothesis, the tension reaches the maximum on the surface of the mobile regions and the minimum in the

immobile zones and would decrease in the proportion in which it spreads into the interior of the organ. The result is that these are the zones of predilection for the manifestation of the tuberculous lesions, which undergo feeble dynamic tension, the notion of an inspiratory traumatism thus being excluded. In return, as the cough occurs suddenly, the diaphragm causes an excess of pressure on the superior lobe and it distends. That is the phenomenon of 'the lighting up of the apexes during coughing, which is well known to roentgenologists. Consequently at the time of coughing there is a sudden augmentation of tension, which results in a veritable traumatism. This traumatism affects with preference the fragile portions of the upper lobe, that is to say, the juxtacleidohilar region and the juxtascissural region. It is precisely there that the majority of the pulmonary lesions of the secondary infection originate. During coughing the lower lobes, compressed by the elevation of the diaphragm, do not undergo any abnormal or traumatizing tension and tuberculosis is also less frequent there. Finally it is the cough, a pathologic phenomenon, which traumatizes the lung and not the normal or forced inspiratory expansion. Then it is that the traumatized lung, in the presence of the tubercle bacillus, becomes the suppurating lung. Besides clinical observation teaches that the majority of tuberculous patients in the beginning were only coughers.

## Monatsschrift f Geburtshilfe u Gynakologie, Basel

106 257 320 (Oct.) 1937 Partial Index

Value of Roentgenologic Diagnosis in Case of Delivery with Narrow Pelvis H Martius—p 257

\*Regeneration of Erythrocytes Following Gynecologic and Obstetric Hemorrhages Influence of Estrogen on Erythropoiesis H Schwalm—p 274

\*Estrogen in Local Treatment of Pruritus Vulvae W Reifferscheid—p 287

Results of Expectant Treatment of Abortion W Mondt—p 291

Treatment of Febrile Abortions in Last Three Years H Reiber—p 298

**Influence of Estrogen on Erythropoiesis**—Schwalm says that young women seem to tolerate great losses of blood more readily than do older women and suggests that the activity of the ovary might play a part in this. He made studies on this problem and found that the regeneration of erythrocytes takes a different course in women with normal function of the ovaries than in women of the menopausal age. In the latter the regeneration is later and begins at once in a form that in young women is known as the regeneration of exhaustion. The administration of estrogen, without other stimulation of the erythropoiesis, produces in young as well as in menopausal women a slight temporary stimulation, but the hemoglobin content and the number of erythrocytes are not influenced. From this it might appear that estrogen does not have an erythropoietic effect. Moreover, in women with ovarian insufficiency estrogen had no effect whatever on the erythropoiesis. It is suggested that the ovarian insufficiency might be only a part of a dysfunction of all regenerative processes and that the ovary does not have a central effect but is only one gland among others. This would correspond with the poor therapeutic effect of large doses of ovarian hormone in forms of amenorrhea.

## Estrogen in Local Treatment of Pruritus Vulvae—

After pointing out that irradiation has failed to produce the desired results in pruritus vulvae, Reifferscheid shows that a decided change was brought about in the treatment of this disorder when Buschbeck and Seitz recommended endocrine therapy in the form of large doses of estrogen. He says that estrogenic therapy has been used by him in cases of essential pruritus and of kraurosis for more than three years. The favorable results that were obtained with the injection of estrogen suggested a trial with the local application. The author prepared an ointment, 1 Gm of which contains 0.5 mg of estradiol benzoate. This ointment was used by fourteen patients and all except one stated that they obtained considerable relief with it. Ten of these patients (four of them with kraurosis) are entirely free from symptoms under the influence of the regular use of the ointment. The patients are told to massage the ointment into the external genitalia in the evening and, if the pruritus is severe, also in the morning. As the use of fat alone did not bring the desired results and as no anti-

thetizing substances were added to the ointment, the estrogen must have been the effective factor. To be sure, the mode of action of the percutaneous application of estrogen is not understood as yet. The author concludes that the ointment is a valuable aid in the treatment of vulval pruritus, even though it may not produce cure, it improves the symptoms and is a valuable adjuvant to endocrine treatment by injection.

### Archivio di Radiologia, Naples

13 177-316 (May and June) 1937

- \*Anatomic Equivalent of Fine Interlobar Projections of Lung L. Bargi —p 177  
Action of Stimulation of Large Intestine by Food in Upper Intestinal Structure D. Messuti —p 193  
Paget's Disease with Uncommon Symptoms Case G. Bonifazi —p 217  
Action of Marconi Therapy in Experimental Peritonitis with Colon Bacillus L. Giacobbi —p 220  
Roentgenography of Cecum C. Guarini —p 228

**Anatomic Equivalent of Fine Roentgen Projections of Interlobar Fissures of Lung**—Bargi carried on roentgen studies on the interlobar fissures of the lung in normal persons and roentgen and microscopic studies on cadavers and dogs. He concludes that fissures of the lung which on microscopic study are normal may show as capillary lines in roentgenograms of the lung taken in the dorsoventral and laterolateral projections. The projectability of normal interlobar fissures does not depend on a given direction. If the capillary line appears in the roentgenogram which is taken at a given angle, it may appear as well with other angles. Capillary lines may vary in form, number and intensity, according to their direction. They may migrate upward or downward in relation to a fixed point of reference in the roentgenogram (the shadow of the second, third or fourth ribs) inversely to lowering or elevating the x-ray tube. These changes show that the appearance of the capillary line in the roentgenogram depends on the incidence of a tangent ray on a more or less long segment of the surface of the interlobar fissures, near to or remote from the x-ray plate. In some cases the capillary line does not appear in the roentgenograms even when taken at different angles. The reasons for the lack of x-ray visualization of the interlobar fissures in such cases are unknown. Owing to the frequent appearance and changes of form, number and intensity, the linear shadows of the roentgenograms of the lung cannot be considered of pathologic significance. A differential diagnosis between shadows from normal fissures and those from acute inflammation of the fissural pleura is easily made. However, in certain cases the capillary shadow of a small fragment of the interlobar fissures with slightly inflamed pleura may be similar to that given by a longer segment of a normal fissure.

### Clinica Medica Italiana, Milan

68 745-820 (Nov.) 1937

- \*Metabolism of Vitamin C in Heart Diseases and Action of Cevitamic Acid on Diuresis P. Stefanutti —p 747  
Primary Malignant Duodenal Granuloma with Solar Algie Symptoms Clinical and Anatomopathologic Study F. Schirappoli —p 761  
Syndrome of Acute Hypo-Adrenalism Case G. Ceruti —p 779  
\*Creatine and Creatinine Ratio in Decompensated Heart Diseases Before and After Treatment with Aminoacetic Acid L. Manca —p 789  
Carcinocirrhosis of Liver Clinical and Anatomopathologic Study G. V. Ravasio —p 807

**Diuretic Action of Cevitamic Acid**—Stefanutti found that the amount of cevitamic acid eliminated in the urine before and after administration of an intravenous injection of cevitamic acid is diminished in patients with decompensated heart diseases in comparison to that eliminated by normal persons. The diminution depends on the increased consumption of cevitamic acid by the body which is due to the presence of disorders of water metabolism and of the peripheral circulation. That the diminution does not originate in an insufficient supply of cevitamic acid to the body from a diet which consists only of milk is proved by the fact that it does not occur in normal persons. Cevitamic acid administered intravenously, increases diuresis with daily increased elimination of chlorides and urea. The increase is more intense in decompensated heart diseases than in normal conditions and is unrelated to the functions of the heart and kidney. According to the author, cevitamic acid has a direct action on the liver and the capillaries by which the water

metabolism and the peripheral circulation, especially in the liver and the capillaries, are improved with consequent increase of diuresis.

**Creatine-Creatinine Ratio in Decompensated Heart Disease**—Manca studied the metabolism of creatine and creatinine in ten patients who had decompensated heart diseases before and after administration of aminoacetic acid, which was given orally in doses of 15 Gm a day for four or five consecutive days. The determination of creatine and creatinine was carried out in the blood and urine throughout the test period. The author found that aminoacetic acid improves the nutritional condition of the myocardium and the metabolism of creatine and creatinine with consequent clinical improvement of the patient. The elimination of creatine bodies through the urine and the amount of creatine bodies in the blood are diminished. Aminoacetic acid induces favorable changes in the metabolism of albumin by which the myocardium regains its functions in fixating creatine and creatinine in sufficient amount to carry on energetic contractions. In decompensated heart disease the author advises a combined treatment of dextrose, insulin and aminoacetic acid. The aim is to control the factors involved in the exhaustion of the myocardium.

### Endocrinologia e Patologia Costituzionale, Bologna

12 511-627 (July) 1937

- Biometric Methods for Evaluation of Individual Constitution F. Fris setto —p 511  
Biometric Study of Two Hundred Old Men L. Alestra —p 532  
Influence of Endocrine Glands on Individual Terrain of Tuberculous Patients O. M. Mistal —p 555  
\*Correlation Between Vital Capacity of Lung and Anthropometric Characters in One Hundred Normal Male Youths G. Scalori —p 573  
Constitution in Diabetes Insipidus Sellma Gualco —p 590

**Vital Capacity of Lung**—Scalori found, by anthropometric determinations made on 100 normal young men between 17 and 18½ years of age, that the highest coefficients of correlation of the vital capacity of the lung are those which exist between the capacity and the somatic value ( $+0.715 \pm 0.033$ ) and again between the capacity and height ( $+0.669 \pm 0.037$ ). The somatic value is of morphologic significance because it includes the figures of the trunk and extremities. The figures of the coefficients of correlation between the vital capacity and the upper part of the abdomen and the total abdomen are higher than those given by the values of the thorax and its perimeter. The figures of the actual vital capacity are higher than those of the vital capacity which are calculated from the thoracic value when the ratio of the values of the upper part of the abdomen and of the thorax is of a brachymorphic character. When the ratio of the values of the trunk and extremities is positive the figures of the actual vital capacity are higher than those of the vital capacity which is calculated from the height. The correlation between the vital capacity and the greatest thoracic excursion in respiration is slightly positive ( $+0.137 \pm 0.067$ ). When the thoracic excursion in respiration increases, the figures of the actual vital capacity are higher than those given by the vital capacity which is calculated from the values of the thorax and its perimeter. The author compares the coefficients of correlation between the vital capacity of the lung and the morphology and respiration of young men with those previously reported in the literature.

### Policlinico, Rome

44 593-644 (Dec. 1) 1937 Medical Section

- Bile Salts Cholemia in Relation to Bradycardia and Pruritus in Jaundice A. Pozzi —p 593  
\*Acute Diffuse Glomerulitis as Allergic Disease Desensitization Treatment F. Corelli —p 605  
Skin Reaction of Men to Tubercle Bacilli Further Researches E. Carlinfantini —p 635

**Acute Diffuse Glomerulitis**—Corelli states that acute diffuse glomerulitis is of allergic origin. The antigens may be bacterial especially streptococci, or nonbacterial. The spasm of the renal vessels and ischemia, which take place early in the development of the disease, are early phases of an allergic process which is followed by hyperemia, albuminous exudates, diapedesis of the erythrocytes and endothelial proliferation. The author's statements are based on a review of the literature and

especially on the satisfactory results obtained in the nonspecific desensitization of eleven patients suffering from the condition. The treatment consists of intravenous injections of progressive doses of from 3 to 7 cc of a solution which is prepared by the following formula: magnesium thiosulfate 1 Gm, calcium chloride 0.8 Gm, dextrose 1 Gm and saline solution 10 cc. The injections are given exceedingly slowly, and the number varies from three to ten according to the results obtained. They are given one every other day up to the third injection and then at intervals of three or four days. Rarely more than three injections are necessary. The treatment induces rapid and permanent regression of the disease. Diuresis increases, edema disappears, hypertension, hyperazotemia and albuminuria decrease and the general condition of the patient improves. The treatment is indicated in the various forms of diffuse acute glomerulitis from tonsillitis, rheumatism and scarlet fever, as well as in nephritis from chemotherapy, serum therapy and transfusion. The results are not satisfactory in circumscribed glomerulitis, renal amyloidosis and lipid nephrosis. In chronic glomerulitis the general condition of the patient improves but azotemia and hypertension are not modified. According to the author the treatment desensitizes the kidney against local allergy. The treatment of desensitization, given early in the development of diffuse acute glomerulitis, results in the prevention of a chronic evolution. Development of diffuse acute glomerulitis is prevented by protecting allergic patients from exposure to low temperatures, cold and other diseases which may stimulate the development of latent renal allergy. The patients are kept in bed in warm rooms and under close observation for the development and early treatment of tonsillitis, sore throat, renal disorders or alterations of the arterial pressure. In cases of scarlet fever the desensitization treatment can be administered at intervals of days to prevent the development of acute diffuse glomerulitis.

### Prensa Médica Argentina, Buenos Aires

24 2469 2516 (Dec 29) 1937

- Study of the Star Shaped Plant (*Pluchea suaveolens*) C Bonorino Udaondo G P Gónalons R R Basile H Zunino and J J Lacour —p 2469
- Ectopic Kidney in Pelvis Simulating Tumor of Adnexa N Arenas and E Bayona —p 2479
- \*Search for Tubercle Bacilli in Gastric Juice of Adults by Inoculation into Guinea Pigs J Lopez Bonilla —p 2484
- Myoma of Ovary E A Vorta —p 2490
- Ectopic Decidua and Decidual Reaction R Gandolfo Herrera —p 2493
- Microdetermination of Biogenic Copper and System of Oxidases of Normal Metabolism D Echave —p 2497
- Abortion and Sterility in Syphilitic Couples Cases A Garfunkel and J C Aranibar Uribe —p 2498
- Alkermic Acute Lymphadenitis Crise F Bazan and R Maggi —p 2500

**Tubercle Bacilli in Gastric Juice**—Lopez Bonilla states that the search for tubercle bacilli in guinea pigs which are inoculated with the fluid of gastric lavage from fasting patients is a procedure rarely used for the diagnosis of pulmonary tuberculosis in adults. The technic is that described in the literature by Meunier and Armand Delille. The gastric juice of patients who have fasted for eight or nine hours is obtained by means of a gastric lavage with 80 or 100 cc of sterile physiologic solution of sodium chloride and centrifugated. A part of the sediment is directly examined under the microscope or used in preparing culture smears, which are stained by Ziehl-Nielsen's technic and then examined microscopically for tubercle bacilli. Guinea pigs are inoculated with the other part. More than one guinea pig is inoculated for each case. The presence of tubercle bacilli in microscopic preparations from the ganglions or organs of guinea pigs shows positive results. The author resorted to the method in twenty-two cases of pulmonary tuberculosis which included early tuberculosis, apical hematogenic nodules and patients who had recovered after treatment with gold salts or artificial pneumothorax. None of the patients had clinical symptoms. The x-ray shadows of the apical region were slightly abnormal in the four cases of early pulmonary tuberculosis. The injection of the gastric juice of the patient into the guinea pigs gave positive results in all cases. The x-ray shadows of the apical region showed hematogenic nodules in five cases. The inoculation test gave positive results in

three cases, in one of which the nodule evolved to a tuberculous cavity. The group of patients who recovered from pulmonary tuberculosis included six who had been given treatments with gold salts and eight who had had an artificial pneumothorax for more than one year. The clinical examinations of the patients the x-ray examinations of the thorax and the direct examination of the sputum showed complete control of tuberculosis. The test of inoculation into the guinea pig gave positive results in one of the patients who had received a treatment with gold salts and in five pneumothorax patients. The author points out the value of the test for the treatment of early tuberculosis and of apical hematogenic nodules, as well as for indicating the advisability of the administration of gold salts or pneumothorax insufflations for the patients, and also as a test for verifying the persistence of satisfactory results from artificial pneumothorax.

### Klinische Wochenschrift, Berlin

16 1705 1736 (Dec 4) 1937 Partial Index

- Determination of Circulatory Efficiency as Measure for Estimation of Athletic Capacity G Zaepfer —p 1705
- Shifting of Water in Renal Medulla F Fuchs and H Popper —p 1708
- Modification of Vital Capacity of Lung by Bandaging Extremities G Budelmann —p 1711
- Coagulation of Blood. Method of Preparation of Coagulable Pulverized Dry Plasma for Isolation of Fibrinogen H I Kurten —p 1713
- Independence of Coagulation of Blood from Presence of Thrombokina e. H F Kurten —p 1714
- Metabolic Investigations in Administration of New Protein Preparation. E Grafe and G Sack —p 1714
- \*Influence of Insulin on Alcohol Exchange in Human Subjects B Siegmund and W Flohr —p 1718

**Influence of Insulin on Alcohol Exchange**—Siegmund and Flohr direct attention to reports by Bickel and his associates according to which insulin promotes the combustion of alcohol in the organism, that is, the greater the supply of insulin, the more quickly will alcohol be destroyed in the organism. To verify these statements the authors made tests on three healthy men. In summarizing their observations they state that if moderate quantities of alcohol are taken, the administration of 40 units of insulin usually produces an increase in the alcohol metabolism. However, this increase is rarely continuous; periods of increase are often followed by periods of decrease. Insulin has a greater affinity for the metabolism of sugar than for that of alcohol. The more unstable the sugar metabolism, the greater is the action of the insulin on the alcohol metabolism. There is no indication that the time of administration of the insulin (during the postresorptive phase or simultaneously with alcohol together with moderate amounts of sugar) is of decisive importance. The administration of sugar occasionally retards the resorption of alcohol. There is no evidence that medication with insulin reduces the symptoms of intoxication and that moderate amounts of insulin hasten the disappearance of the signs of intoxication. Even though the alcohol content of the blood shows an accelerated reduction under the influence of insulin, if the resorption is retarded there may be blood alcohol values that are above those which are detected in the absence of insulin medication. The authors warn against the use of moderate doses of insulin (0.5 unit per kilogram of body weight) to overcome the effects of alcoholic excesses, because, aside from the doubtful efficacy of this measure, a rapid decrease in blood pressure and a hypoglycemic shock may result. Moderate quantities of sugar cannot avert this danger.

### Medizinische Welt, Berlin

11 1663 1698 (Nov 27) 1937 Partial Index

- Fresh Air Stimuli in Treatment of Pneumonia in Children J Jochims —p 1663
- Protection Against Loss of Heat and Colds During Childhood A F Hecht —p 1669
- Prophylaxis and Treatment of Colds in Nurslings and Children K Hofmeier —p 1670
- History Classification and Diagnosis of So-Called Rheumatism E Oldemeyer —p 1673
- \*Noninflammatory Rheumatism of Spinal Column (Spondylitis Deformans) H Hennes —p 1676
- Physical Therapy in Acute Rheumatic Diseases H Kaether —p 1680

**Noninflammatory Rheumatism of Spinal Column**—After pointing out that rheumatism of the spinal column becomes manifest in several forms, and after listing these forms Hennes gives his attention to the degenerative forms, particu-



larly spondylosis deformans, which is the most frequent of the disorders of the spinal column. As in degenerative articular rheumatism, the functional factor probably plays the most important part, but others, such as faulty nutrition, poor general condition and faulty exertion, may play a part. The decisive factor is that the functional use exceeds the functional capacity. The changes in the vertebral body involve the shape as well as the internal structure. The body shows an increased "waist formation" and is flatter. Proliferations on the edges seek connection with the adjoining vertebrae and may embrace the intervertebral disks. Thus there develop the roentgenologically visible formations in the shape of points, notches, beaks and clasp. Since wear and use play a part in the development of this form of spondylosis, it is comparatively rare in patients below the age of 40. With increasing age, the changes become more frequent. Roentgenograms of the spinal column of persons beyond the age of 60 nearly all reveal such changes. The lumbar region is most frequently involved and then follow the cervical region and the thoracic portion. The extensiveness of the roentgenologic changes does not necessarily correspond to the seriousness of the complaints. There are patients with severe changes who have only slight complaints to make. The chief symptom of the disorder is pain and the restriction of movement caused by it. All the dependent muscles and nerves are affected. If the cervical portion of the spinal column is involved there may be pains in the region of the shoulders and neck, which may radiate into the arms and behind the ears. In case of changes in the thoracic region, intercostal neuralgias are often complained of, in case of lumbar changes, pains in the lumbar and sacral regions and in the legs are the chief complaints. If the patient rests and refrains from exertion, the pains usually subside. The clinical examination reveals stiffness in walk and posture. The spinous processes are usually sensitive to percussion. The musculature of the back is often painful and rigid. Discussing the treatment, the author suggests rest and the application of heat, baths and rays. In order to insure lasting results for these treatments, the underlying irritation must be eliminated. The physician should investigate the patient's occupation and, if necessary, should suggest a change in work. In discussing the differential diagnosis of spondylosis deformans the author stresses the differentiation from chronic inflammatory rheumatism of the spinal column (spondylarthritis ankylopoietica), with which it is most readily confused. He lists the characteristic symptoms of these two conditions in opposite columns.

### Munchener medizinische Wochenschrift, Munich

84 1841 1888 (Nov. 19) 1937 Partial Index

Complications of Influenza H Curschmann —p 1844

Therapy of Influenza P Martini —p 1848

\*Results of Tonsillectomy in Three Hundred and Thirty One Cases of Rheumatism L Stetter —p 1857

Animal Experiments on Healing of Wounds with Cod Liver Oil and on Action of Its Constituents W Lohr F Unger and K Zacher —p 1859

To What Extent Is Tuberculosis of Children Infectious for Children? H Rietschel —p 1862

Value of Serodiagnosis of Tuberculosis in Simultaneous Application of Various Reactions P Weiland —p 1863

**Tonsillectomy in Rheumatism**—Opinions are still divided regarding the value of tonsillectomy in rheumatic disorders. Stetter investigated the efficacy of this intervention in 397 rheumatic patients, concerning 331 of whom he was able to obtain information. About 69 per cent of the patients stated that the tonsillectomy had produced favorable results, whereas 31 per cent observed no improvement or exacerbation of the rheumatic symptoms after tonsillectomy. About 8 per cent of the patients complained that since the tonsillectomy they were troubled with disturbances of the throat and upper respiratory passages. In classifying the material in various groups, the author finds that in the acute cases in which fever and articular swellings existed not more than six months, the results of tonsillectomy were usually favorable. In subacute cases and in cases which became secondarily chronic the effects were comparatively favorable but in the cases of primary chronic articular rheumatism the results were much less favorable. The author concludes that the general results justify the continuation of the surgical treatment of the foci of infection.

**Serodiagnosis of Tuberculosis**—Weiland discusses the results of serologic tests for tuberculosis. The tests employed were the complement fixation reaction according to Witebsky-Kuhn-Klingenstein, the Meimcke tuberculosis reaction and the immunoconglutination reaction according to Haag's technique. The serums on which the tests were made were from healthy persons, from patients with various disorders but without tuberculosis, from patients with different stages of pulmonary tuberculosis and from patients with syphilis some with and some without tuberculosis. The author reaches the conclusion that serologic tests for tuberculosis have considerable value. However, as in syphilis, each serum should always be subjected to several tests and one of the tests should be a complement fixation test. The serologic tests for tuberculosis are indicated for the differential diagnosis, for group examinations of supposedly healthy persons and for scientific research. In cases in which the diagnosis of tuberculosis has been clinically established the serologic examination is practically superfluous, except that, as some believe, it may provide prognostic information.

### Zentralblatt für Gynäkologie, Leipzig

61 2893 2940 (Dec. 18) 1937 Partial Index

\*Birth After Vaginal Transplantation of Tube for Restoration of Uterine Cavity P Strassmann —p 2894

\*Hormones as Causes of Prolonged Pregnancy A von Arny —p 2900  
Question of Cardiac Activity in Young Human Embryos J Lukinovic —p 2912

Eclampsia W Hattingen —p 2915

**Birth After Restoration of Uterine Cavity**—Strassmann says that the restoration of a functioning uterine cavity by means of vaginal transplantation of the tube into the totally atretic uterus effected a return of menstruation in six cases. It was possible in five of these cases to let from 1 to 2 cm of the free fimbriated termination protrude into the free abdominal cavity. Thus the ovum could be conveyed and pregnancy was possible. One of the women not only became pregnant but gave birth to a living child. A detailed history of this case is followed by a discussion in which the author directs attention to a procedure which A Fuchs employed in seven cases after supravaginal amputation. By leading the tube through the cervical uteri, menstruation was reestablished in several of the cases. Discussing the terminology of these plastic operations, Strassmann points out that the term "tubal fistula" is not satisfactory, in that the tubal cavity, which is a substitute for the uterine cavity and which has a natural opening toward the abdominal cavity and toward the cervix, is not a fistula but a plastic restoration of the canal of gestation, which takes over menstruation and conception.

**Hormones as Causes of Prolonged Pregnancy**—After directing attention to previous studies on the influence of hormones on gestation and delivery, von Arny describes further investigations on this problem. At first it was assumed that the prolongation of pregnancy or missed labor was a result of the hormone action of the corpus luteum. However, experiments with corpus luteum preparations on pregnant rabbits did not influence the length of the gestation. In further experiments on pregnant rabbits the author investigated the action of the hormone of the anterior hypophysis by administering to the animals a preparation that contained the gonadotropic factor of pregnancy serum. Missed labor was the result. The prolonged pregnancy had to be artificially interrupted. These and other experiments convinced the author that the gonadotropic hormone of the anterior hypophysis reduces the spontaneous activity and the reactivity of the uterus toward the hormone of the posterior lobe of the hypophysis. Thus it insures rest for the pregnant uterus and the undisturbed development of the gestation. During the second half of the pregnancy however, there is a decrease in the gonadotropic hormone of the anterior lobe and its activity gradually subsides. At the same time the estrogenic hormone, which exerts the opposite action, gains the ascendancy. However, if the predominance of the gonadotropic hormone of the anterior hypophysis is maintained by the continuous administration of this hormone, the reactivity of the uterine musculature is reduced. There is no delivery, the fetus is retained and the symptoms of missed labor result.



## Wiener Archiv fur innere Medizin, Vienna

31 231 300 (Nov 30) 1937

- Still's Disease in Adults Case R Neugebauer—p 231  
 Investigations on Biology of Fat Organ F L Pool—p 237  
 Blood Pressure of Patients with Hypertension in Its Relation to Cardiac Insufficiency and to Extracardiac Factors L Popper—p 243  
 \*Evaluation of Bilirubin Tolerance Test According to von Bergmann Eilbott U Strasser—p 267  
 Unusual Combinations of Various Types of Anemia with Icterus C V Medvei and Stina Bjork—p 287

**Evaluation of Bilirubin Tolerance Test**—Strasser says that the multiplicity of hepatic functions requires various test methods for the analysis of these different functions. He mentions which of the many available hepatic tests are customarily used at his clinic and then gives his attention to the bilirubin tolerance test of von Bergmann-Eilbott. This method is of particular interest because it tests the liver not with a foreign substance but with one which, under physiologic conditions, is formed or, at any rate, eliminated by the liver. The author reports his observations in the course of 100 bilirubin tolerance tests. The bilirubin content of the citrated plasma was determined before the intravenous injection of the alkaline bilirubin solution and four minutes after and three or two hours after the injection. The results are recorded in tables. In the summary the author says that his observations corroborate the reports in the literature. They show that the bilirubin tolerance test according to von Bergmann-Eilbott is suitable for the detection of even slight disturbances in the excretory function of bilirubin. If the test is made on the fasting patient, it is capable of indicating acute disturbances caused by alcohol, residual disorders after parenchymal changes, and functional disturbances that develop especially early in incipient cirrhosis. If the test is made when the patient takes food, the additional value, the retention, is considerably increased in normal as well as in pathologic cases. The subcutaneous injection of histamine or of dehydrocholic acid apparently does not influence the retention. The author reaches the conclusion that the bilirubin test of von Bergmann-Eilbott, like several other functional tests of the liver, is a valuable aid in the diagnosis of hepatic disorders. To be sure, its results have to be evaluated together with those of other tests and with the clinical observations.

## Novyy Khirurgicheskii Arkhiv, Dnepropetrovsk

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- Subcutaneous Rupture of Spleen T D Bakermolov—p 331  
 \*Late Results of Treatment of Intestinal Obstruction V E Istomin—p 339  
 Late Results of One Hundred and Sixty Seven Cases of Crile's Operation for Metastases and for Primary Tumors of Neck A S Fedoreev—p 379  
 Solitary Kidney M G Kupershlyak—p 385  
 Alferov's Operation for Hydrocele of the Testicles A M Aminev—p 396

**Treatment of Intestinal Obstruction**—According to Istomin, the mortality rate among patients submitted to operative intervention for the cure of intestinal obstruction amounted to 38 per cent (forty-five of a total of 173). The author emphasizes the point that all too frequently patients who have been discharged as cured continue to ail. A follow-up study of 128 patients in whom 157 operations were performed showed that twenty-six (20 per cent) required further operative interventions for recurrences two, three and more times. A follow-up study after 149 operative interventions revealed that late results were entirely satisfactory in only thirty-three patients (22 per cent). In forty-two (28 per cent) the results were unsatisfactory and in seventy-four (50 per cent) they were poor. Among the poor results were included twenty-six secondary operations with five fatalities, and four fatalities resulting from recurrences in which there were no operations. The remaining forty-four patients presented either recurrences of attacks of intestinal obstruction, which thus far could be relieved by conservative measures, or a series of symptoms on the part of the abdominal viscera. There were ninety-two patients treated conservatively. The anatomic diagnosis in this group was possible in only a few instances. Late results were entirely satisfactory in seventeen (19 per cent), unsatisfactory in thirty-one (33 per cent) and poor in

forty-four (48 per cent). The late results of both the radical and the conservative methods were not satisfactory in about half of the patients. A successful operative intervention, while saving the life of the patient, does not, in the majority of the cases, give a satisfactory late result. About three fourths of the patients suffer from constipation, which they try to overcome by enemas and cathartics, and from attacks of abdominal distention. Operative interventions for intestinal obstruction are frequently followed by the formation of adhesions. The author observed the formation of ventral hernia in twenty-six patients (28 per cent) out of ninety-two, 17 per cent of these followed in cases of primary healing of the wound. He ascribes this unusually high incidence to the great increase in the intra-abdominal pressure in cases of intestinal obstruction both before and during the first few days after the operation. He suggests that every patient with acute intestinal obstruction be submitted first to conservative therapy consisting of enemas and application of heat for from one to two hours. The discharged patient requires further observation, treatment by physical therapy and a proper diet.

## Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

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- Treacherous Complications in Ear Infections A DeKleyn—p 589  
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 \*Treatment of Fractures of Neck of Femur and of Pertrochanteric Fractures L W Van Ouwkerk—p 5907  
 \*Mechanism of Reaction for Serum Proteins in Feces A Van Meeteren—p 5922  
 Treatment of Epidemic Encephalitis P H Kramer—p 5925

**Protection of Skin Against Mustard Gas by Cellulose Preparations**—Klarenbeek points out that the question of protection of the skin against mustard gas has been investigated repeatedly. It has been found that some substances among them glycerin and glycerin gelatin mixtures, are hardly at all permeable to mustard gas. This characteristic of glycerin led to studies on cellulose preparations, particularly cellophane, all of which contain glycerin. In fact in some countries cellophane was already recommended for the protection of the civil population against mustard gas. The author describes studies which prove that cellulose compounds are an effective protection against mustard gas for a considerable time. This characteristic of cellulose compounds makes them useful in several ways for the protection not only of foodstuffs and clothes but also of the skin of human beings and animals. To be sure, before a cellulose product is used for this purpose, its permeability for mustard gas must be determined.

**Treatment of Fractures of Neck of Femur**—Van Ouwkerk discusses the results of the treatment of 119 cases of medial, that is, subcapital and transcervical, fractures of the femur and of 107 cases of lateral, that is, intertrochanteric and pertrochanteric fractures of the femur. He found that extension treatment in abduction and endorotation produces excellent results in lateral or pertrochanteric fractures. The results of this treatment in the medial fractures are at least as good as those of the plaster cast treatment or of the osteosynthesis with a periosteum-covered peg of the fibula. The extension bandage does not have the disadvantages and dangers of the large plaster cast bandage. The author says that, after reduction of the fracture traction should not be more than 4 Kg. The results with the extension treatment were so favorable that as yet there was no need for the Smith-Petersen operation with the three-flanged nail.

**Mechanism of Reaction for Serum Proteins in Feces**—Van Meeteren states that in an earlier report in the *Nederlandsch tijdschrift voor geneeskunde* 81 1139 (March 13) 1937 abstracted in *THE JOURNAL*, May 15, 1937, page 1760, he had pointed out that Triboulet's reaction is helpful in the localization of hemorrhages in the digestive tract in that it is negative in hemorrhages of the upper digestive tract (to and including the duodenum) and positive in those of the lower digestive tract. Following these preliminary remarks he describes investigations on the mechanism of the reaction. He found that the reaction is not caused by the albumins but by the serum globulins.

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## THE MENOPAUSE AND ITS MANAGEMENT

EMIL NOVAK, M D

BALTIMORE

The popular concept of the menopause, as is true of all aspects of the phenomenon of menstruation, has been based on folklore rather than on scientific fact, of which there was little until recent years. There is now, however, a growing appreciation of the fact that the "change of life" does not usually entail any very profound alteration in the woman's life current except that depending on the cessation of menstruation and of the reproductive function. The term "climacteric" would seem a more expressive one for this phase, derived as it is from a Greek word meaning "rung of a ladder" and indicating therefore merely that it represents one of the natural transitional steps which must inevitably be taken by every woman on her progress from the cradle to the grave, provided she lives long enough.

As a matter of fact, there are many women to whom the menopause comes as a boon, with striking improvement in general health and well-being, even apart from the elimination of the physical and mental stress which are often entailed by repeated child-bearing and the cares of rearing perhaps many small children. The cessation of the menstrual function, associated as it often is with an increase in weight, has converted many an unattractive, thin, worried woman into the graceful and serene type of matron, veritably a second flowering.

While it is true that the subjective symptoms of the menopause are in the aggregate potentially more disturbing than those marking the inauguration of the menstrual function, two facts may be considered as clearly established: (1) that in only a small minority of women are the characteristic menopausal symptoms sufficiently severe to interfere materially with health and happiness, as measured roughly by the necessity for medical attention, and (2) that many of the symptoms often complained of by women in the fifth decade of life are wrongly attributed to the menopause.

The first of these statements needs no great elaboration. I have recently questioned on this point 100 of my patients who had passed through the menopause and who represented various social types, so that they might perhaps be considered a fairly cross-sectional group. Without going into details, suffice it to say that in seventy-two of this group the menopausal symptoms had not impelled the patients to seek medical help, in twenty there had been treatment with preparations of one sort or another by the oral route,

presumably either glandular substances or simple nerve sedatives, in eight the patients had been given hypodermic treatment for varying periods, obviously with some form of ovarian hormone. These rough figures do not of course constitute an accurate index of the varying degrees of severity of menopausal symptoms, for many other factors are concerned, not the least of which is the enthusiasm or lack of enthusiasm of the medical attendant for endocrine therapy.

As to the second point, it may be asked: What are the characteristic symptoms of the menopause? With reference to only one group will there be general agreement. I refer of course to the well known vasomotor phenomena, especially the periodic flushes and sweats, and, though less frequently noted, the flashes of heat which may involve the whole body. This is not to say that somewhat similar phenomena may not be due to other factors than the menopause, for they are not rarely seen in certain cases of hyperthyroidism, and they may be even more simulatory in the nervous syndrome commonly spoken of as "vasomotor instability," often encountered in middle-aged women and mimicking either the menopause or hyperthyroidism. The latter especially may be quite perfectly imitated, as tachycardia is often a prominent symptom though the basal metabolic rate is normal. It is the latter group of cases which surgeons have learned to shy away from, for thyroidectomy does no good and may do harm.

In spite of these relatively rare exceptions, the fact remains that vasomotor flushes and sweats in the woman of menopausal age, especially when menstruation is becoming scantier, less frequent or has ceased altogether, may usually be assumed to be the direct result of the endocrine readjustment characterizing this phase of life. But they are not so clearly objective as, for example, the symptoms following extirpation of the thyroid or parathyroids, or those associated with tuberculous destruction of large areas of the adrenals. The psychic hook-up of the menopausal hormone factors primarily concerned seems much more intimate, so that the severity of the vasomotor phenomena may be much influenced by the patient's psyche. This not only makes it difficult to evaluate the results of organotherapy but at the same time clearly indicates that organotherapy is only a part of the management of the menopause.

It is surprising that there has been so little discussion, much less study, as to the mechanism of the menopausal vasomotor phenomena. The brilliant advances made in reproductive physiology have added little to our knowledge concerning this question. No other animal, so far as we know, exhibits similar phenomena, so that the experimental approach, through the study of lower animals, appears to be blocked. The very nature of the vasomotor flushing, its dis-

From the Department of Gynecology, Johns Hopkins University School of Medicine.

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tribution and its apparent kinship to the phenomenon of blushing suggest that the immediate factor is the vasomotor nerve apparatus and that behind this are stimuli from the higher areas of the brain. The obvious implication is that there are points of contact between the hormonal and cerebral pathways, for which indeed there is evidence in other phenomena as well.

As bearing on the problem under discussion, it would seem that recent investigations pointing to the probable existence of a rhythmic sex center at the base of the brain, presumably in the parhypophyseal area and quite certainly hooked up with the hypophysis itself, offers the logical hint as to the location of the psychoneurohormonal liaison concerned in the vasomotor disturbances of the menopause. It is much too early, however, to consider this as established, especially as we are entirely ignorant as to the mechanism or the pathways concerned.

As regards the hormonal readjustments of the menopause, it seems clear that these are initiated by failure of ovarian function and that this is due to a natural limitation of the ovary's physiologic life span. It has not been possible in postmenopausal animals to reactivate the ovary by any form of pituitary injection or implantation. Westmann alone claimed to have brought about in this way the production of corpora lutea in postmenopausal ovaries, but his results have not been supported by other observers.

According to Zondek the hormone picture presents differing aspects at different phases of the menopause. There is first a period during which estrone is present in excessive amount (hyperfolliculism), then one in which there is a deficiency of this hormone (hypofolliculism), and finally a phase, continuing on for many years, in which the gonadotropic pituitary hormones are present in excessive amount. This final phase Zondek spoke of as polypiolanism, though now the term prolan is commonly limited to the anterior pituitary-like substances found in the urine of pregnant women.

There is no doubt, from the work of various subsequent investigators, that the hormonal picture of the menopause is really a kaleidoscopic one and that the sequence of events originally described by Zondek is not the invariable one.

It is during the stage of estrone excess that one is most apt to have menstrual excess, though there are many exceptions to this. It is of interest to note, however, that women who suffer with functional bleeding of the menopause seem as a group to exhibit relatively mild degrees of vasomotor disturbance. This, at any rate, has been my own clinical observation, though it would be of interest for some one to undertake the considerable task of making correlated clinical and endocrine studies in a large group of such cases, contrasting them with patients in whom menstruation is scanty, with perhaps long periods of amenorrhea. Even this would not be convincing, because of the probability that both vasomotor symptoms and quantitative menstrual disorders are dependent rather on individual hypophysis-ovarian interreactions than on hormone levels alone.

As already stated, the occurrence of the menopause is characteristically associated with the appearance in the urine of considerable amounts of the pituitary gonadotropic factors, especially the one concerned with follicle ripening. Indeed it was formerly thought that only this latter of the pituitary sex hormones was to be found, but Frank and Goldberger, in a recent

study, were able to demonstrate the occasional presence of the luteinizing factor as well.

There are some, like Albright, who believe that the vasomotor menopausal symptoms are due rather to the gonadotropic excess than to the estrone deficiency, but more and more the evidence indicates that it is the disruption of the previously existing quantitative balance between the hypophyseal and ovarian functions which is responsible for any menopausal clinical upset, and that the prime factor in this is the withdrawal or lessening of the ovarian secretion. Many investigators have shown that the administration of sufficiently large amounts of estrone brings about disappearance of the gonadotropic factor, just as withdrawal of the ovarian secretion increases gonadotropic activity.

I present these few angles of a very large question simply to point out that the administration of estrogenic substances in women suffering with undoubted menopausal symptoms is strictly in accordance with present day physiologic knowledge. This is true whether such therapy is carried out in a purely substitutional way, with the idea of easing the hormonal adjustment and making it more gradual, or whether it is resorted to with the avowed object of bringing about a lessening of the gonadotropic overactivity of the pituitary.

Aside from the vasomotor phenomena that I have been discussing, a whole legion of others have been ascribed to the menopause, while, in the minds of the public, almost any symptom that happens to occur in the middle-aged woman is apt to be explained by the "change of life." In this connection I wonder whether many of our colleagues are not at times to blame in suggesting to the woman, or in acquiescing in her own ready suggestion, that the menopause is responsible for all sorts of indefinite symptoms, especially when a more likely cause for the latter is not patently clear.

A distinction should be made between (1) those symptoms which are clearly menopausal in origin, in the sense that they are the physiologic results of the cessation of ovarian activity, and (2) those frequently seen in women passing through the menopause but only indirectly or secondarily of menopausal origin and therefore not characteristic. To illustrate what I mean, let us take the example of an average uninformed woman who approaches the menopause with a considerable degree of apprehensiveness. The occurrence of frequent hot flushes and sweats, often disturbing her rest at night and awakening her with a panicky feeling, increases her nervous instability and makes her irritable. Why should not such a woman have headaches, a tendency to insomnia, loss of appetite and other digestive symptoms, or any of many other subjective manifestations? These are certainly not the direct results of any endocrine disturbance, but they are a part of this particular woman's menopausal disturbance.

A similar mixture of direct and indirect menopausal symptoms is seen in milder degree in many women, while in a very large number both the primary and secondary manifestations are of such insignificant degree as to constitute no problem whatever.

Although the hormonal etiology of the vasomotor phenomena is universally accepted, this does not mean that other menopausal symptoms, such as headache, vertigo and irritability, may not in some cases also be direct results of the same cause. But with these subjective symptoms it is much more difficult to establish such a direct relationship, especially as they are so commonly associated with functional neuroses. Hence the hazard of utilizing them as criteria of treatment.

In our management of menopausal women, therefore, we deal only in part, often in very small part, with clear cut and direct manifestations of endocrine disturbance, and the practitioner looking only for these and disdaining all others will often fall far short of the requirements in the individual case. The best results will undoubtedly be obtained by the physician who knows something of gynecology and endocrinology but who is above all a doctor with common sense, which almost includes the additional requirement that he be something of a psychiatrist. There are wide variations in character and degree of the symptoms presented by menopausal women, depending not only on the severity of the hormonal readjustment but also on such factors as the patient's psychic make-up, her social, intellectual and economic status, her family life and her general physical condition. The method of approach must therefore be adapted to the individual case but should always be combined with sympathetic understanding and reassurance and a patient effort to discover, evaluate and adjust such factors as I have mentioned.

While we cannot in practice always sharply separate the direct hormonal symptoms from those which are indirect, it is the former which must serve as our chief guide to organotherapy. The history of gland treatment of menopausal disorders is amusing or pathetic, depending on the point of view. From the time of its first introduction at the old Landau clinic in Berlin in 1896 there has been wide divergence of opinion as to its efficacy. The practice began even before it was known that the ovaries have any secretory function and we now know that the preparations so widely used until recent years (ovarian or corpus luteum tablets or capsules, ovarian residue) were practically inert. And yet many clinicians had convinced themselves of the value of such treatment. For example, the late Dr. William P. Graves, an able clinician, honestly believed and stated that corpus luteum therapy is "almost a specific" in the treatment of menopausal symptoms, referring to the oral use of corpus luteum preparations now known to contain little or none of the active hormone.

Now that we have available for clinical use preparations of the ovarian hormones which are unquestionably active from a laboratory standpoint, one important factor of uncertainty has been removed, but others still remain. For example, we do not know the exact mechanism concerned in the production of the vasomotor symptoms, we know very little of the quantitative hormonal relationships involved, though it is certain that there are wide individual variations, we are still quite ignorant of where and in what amount an administered principle is destroyed, and because of the latter two facts we cannot discuss with any precision the matter of dosage.

And yet, because we have learned much more concerning reproductive physiology and because we can now utilize really active preparations, it may fairly be stated that our results have improved and that organotherapy for this indication is established as a rational procedure. There are few sound clinicians who are extremely enthusiastic about results, but there are few who do not employ the method, because of its rationale and because of the fact that it is so frequently helpful. In evaluating results the proper standard should be the effect obtainable on the vasomotor phenomena and not on the host of other questionable symptoms often seen in menopausal women, as so many writers have done. The effect on the vasomotor symp-

toms can be studied with at least a measure of objectiveness, as has been done by various observers (Novak, Howard and Everett), and the results seem to justify this form of therapy quite clearly.

As regards dosage and methods of treatment, no precise rules can be laid down. It seems certain that endocrine imbalance, not only of the menopausal but also of other types, can occur at very different quantitative levels, so that it is futile to lay down hard and fast rules as to the hormone dosage required. In many instances rather small doses of estrogenic substance seem to suffice, in others much larger doses are required. If, for example, intramuscular injections of 2,500 or 5,000 international units of estrogenic substance in oil (such as theelin, amniotin, or progynon-B) do not give relief, the dosage may be increased to 10,000, 20,000 or rarely even 50,000 units. The heavier dosage, as a matter of fact, is the more popular plan in a good many of the European clinics, though certainly not always necessary.

The duration of treatment is likewise to be adapted to individual indications. Menopausal symptoms are rarely persistently troublesome, and it is usually only during exacerbations that active hypodermic medication is necessary, and only a few injections may be required. In the intervals the patient may need no medication, or at most the administration of some simple sedative of the bromide or barbituric acid group.

In other cases the oral administration of an active estrogenic preparation (amniotin, theelin, theelol, progynon-DH) may be necessary and, in fact, the milder forms of disturbance may require nothing more than oral treatment at any time. This is far more agreeable to the patient than hypodermic medication, and this method is certainly to be preferred when it seems to suffice. My own experience with the occasional very severe vasomotor disturbances, however, is that in these the hypodermic route is much more effective and prompt in its results.

By some such plan, or combination of plans, it has been possible to give varying but usually satisfactory relief in all but a very small proportion of cases, so that I have only rarely resorted to irradiation of the hypophysis, a method which has been highly vaunted in recent years. In my limited experience with the latter plan, obviously as semiempirical for this as for most other functional indications, I would be inclined to agree that light hypophyseal irradiation is apparently harmless and that it may relieve the symptoms in some cases in which organotherapy has failed. I believe that it has a place in the treatment of menopausal symptoms, but it should certainly not have the first place, as it almost seems to have in some clinics.

Finally, it may again be urged that organotherapy and irradiation both will fall far short of the desired result unless they are combined with intelligent management of the particular woman's entire menopausal syndrome. In some women the fear of cancer may complicate the picture, in sterile patients a desperate anxiety for children before the reproductive function ceases, in still others a fear of insanity or a dread of obesity. All these factors should be unearthed if possible, and their correction must constitute a part of the management of such cases.

In this paper we are not concerned with various pathologic conditions which may develop at the menopause, such as functional bleeding, cancer or the so-called involutional psychosis.

## SUMMARY

A distinction must be drawn between the treatment of menopausal symptoms and the management of the woman passing through the menopause. The well known vasomotor group of symptoms are the only ones which seem clearly attributable to the hormonal readjustment of the menopause, though it is possible that others may at times be directly produced. However, the menopausal woman may present many other manifestations only indirectly of menopausal significance, and yet often constituting real problems in treatment, which must be along psychic and general rather than endocrine lines. Only a minority of menopausal women need medical treatment, and a much smaller proportion require organotherapy.

While the mechanism of the vasomotor menopausal symptoms is not clear, the immediate factor is quite certainly the cessation of ovarian function, and ovarian therapy with the now available effective preparations of estrogens is a rational procedure. The results are variable, rarely brilliant, but often satisfactory to both patient and physician. Light irradiation of the hypophysis may be tried if organotherapy is unsuccessful, but its too promiscuous use should be decried.

26 East Preston Street

# THE USE OF NICOTINIC ACID IN THE TREATMENT OF PELLAGRA

TOM D SPIES, MD

CLARK COOPER, MD

AND

M A BLANKENHORN, MD

CINCINNATI

It is now commonly believed<sup>1</sup> that pellagra in human beings and blacktongue in dogs are either analogous or closely related diseases. All food substances which have been curative and preventive for one have been for the other also. The observations of Elvehjem, Madden, Strong and Wooley<sup>2</sup> regarding the cure of canine blacktongue by the use of nicotinic acid suggested that this substance might be useful in the treatment of human pellagra. Since we could find no reports on the effect of nicotinic acid on human beings, a preliminary study was made to determine a safe range of dosage. Thirteen persons, three members of the staff and ten nonpellagrous patients, were given an aqueous solution of nicotinic acid (Eastman) orally each day. The dose varied in amount and was usually begun at a few milligrams daily and in some instances was increased until 200 mg was being given daily. Nine persons had a reaction characterized by severe flushing,

itching and tingling, particularly of the face and extremities, which occurred within twenty minutes after the administration of the nicotinic acid. At the peak of the flushing there was no demonstrable effect on the blood pressure, temperature or respiration. No instance did the oral administration of less than 100 mg produce any effect, and usually the reaction occurred only when large amounts were given. The symptoms in all persons subsided rapidly, leaving no residual changes.

These preliminary observations were continued for several weeks and indicated that nicotinic acid could be given safely by mouth. We then determined that small doses of nicotinic acid, as large as 30 mg, administered intravenously in a solution of sterile physiologic solution of sodium chloride at the rate of 2 mg a minute produced no reaction. We can make no statement as to the limitation of this form of administration. We have given as much as 80 mg to one patient intravenously in a period of several hours and have given infusions of a liter of physiologic solution of sodium chloride containing 100 mg of nicotinic acid without the development of untoward symptoms. With these preliminary observations in mind, we decided that the care was used nicotinic acid could safely be given to pellagrins.

A number of years ago one of us<sup>3</sup> reported a method by which the lesions of the mucous membrane of persons with pellagra could be used as an index for measuring the value of various substances in the treatment of the disease. Briefly, this method consisted in selecting severely ill pellagrins with classic lesions of the mucous membrane, isolating them and controlling conditions so that they ate only a basic diet. The very severe lesions would not heal without specific treatment, but after rest in bed and the ingestion of a basic diet containing up to 2,900 calories daily, an occasional pellagrin showed improvement of these lesions. This "spontaneous" improvement has in our experience usually occurred within the first two or three days of study. It may be due to some food which was ingested prior to the patient's being placed on a basic diet, but occasionally it occurs, at least in part, because such pellagra-producing diets contain small amounts of the antipellagra factor. However, if the lesions of the mucous membrane are fiery red and are not improving while the patient is restricted to a basic diet, they serve as an index for measuring the effect of any single potential therapeutic agent. If the substance is of therapeutic value the lesions heal promptly when adequate amounts of that substance alone are added to the basic diet. The swelling and fiery red color usually subside within forty-eight to seventy-two hours, often this change occurs much earlier. It has been shown that great difficulty arises if one attempts to use the dermatitis of pellagra as an index to judge the efficacy of treatment.

## MATERIAL AND METHODS

**Subjects**—With the foregoing observations in mind and using a method previously adopted for studies on liver extract, yeast and wheat germ, we selected eleven pellagrins for study. The group was composed of two persons with endemic pellagra, three pellagrins whose disease followed chronic addiction to alcohol and six

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From the Department of Internal Medicine, University of Cincinnati College of Medicine. This study was aided by grants from the Martha Leland Sherwin Memorial Fund and the Fleischman Endowment Fund.

<sup>1</sup> Goldberger Joseph and Wheeler G A. Experimental Blacktongue in Dogs and Its Relation to Pellagra. *Pub Health Rep* 43: 172 (Jan. 27) 1928. Wheeler G A. and Sebrell W H. The Blacktongue (Canine Pellagra). Preventive Value of Fifteen Foodstuffs. *Bull* 162 (Nat Inst. Health September 1933) pp 113. Miller D K. and Rhoads C P. Production in Dogs of a Syndrome Similar to Sprue by Diets Deficient in Vitamin B. *Proc Soc Exper Biol & Med* 30: 5-0 (Jan) 1933. Zimmerman H M. and Burack Ethel. Studies on the Nervous System in Deficiency Disease. Lesions Produced in the Dog by Diets Lacking the Water Soluble Heat Stable Vitamin B (G). *J Exper Med* 59: 21 (Jan) 1934. Spies T D. and Dowling A S. The Experimental Production of Anemia in Dogs by Means of a Blacktongue Producing Diet. *Am J Physiol* 114: 25 (Dec) 1935. Koehn C J. Jr. and Elvehjem C A. Studies on Vitamin G (B) and Its Relation to Canine Blacktongue. *J Nutrition* 11: 67 (Jan) 1936. Elvehjem C A. Madden R J. Strong F M. and Wooley D W. Relation of Nicotinic Acid and Nicotinic Acid Amide to Canine Blacktongue. *J Am Chem Soc* 59: 1767 1937.

<sup>2</sup> (a) Spies T D. Pellagra Improvement While Taking So-Called Pellagra Producing Diet. *Am J M Sc* 184: 837 (Dec) 1932. (b) Skin Lesions of Pellagra. An Experimental Study. *Arch Int Med* 52: 945 (Dec) 1933. (c) Observations on the Treatment of Pellagra. *J Clin Investigation* 13: 807 (Sept) 1934. <sup>3</sup> Spies T D. Relationship of Pellagrous Dermatitis to Sunlight. *Arch Int Med* 56: 920 (Nov) 1935. Smith D T. and Ruffin J M. Effect of Sunlight on the Clinical Manifestations of Pellagra. *Arch Med* 59: 631 (April) 1937.

whose pellagra was secondary to organic disease. The selection of these eleven persons depended on the presence of glossitis or stomatitis or both. Other manifestations of pellagra were also present in the majority of cases. In six the condition was of the classic type, with typical lesions of the mucous membrane and dermatitis. In five the cutaneous lesions were absent (pellagra sine pellagra). Tabulation of the relative severity of the lesions was necessarily arbitrary, and more complete descriptions will be found in the individual case reports. A patient was considered as having anemia if the hemoglobin value was less than 12 Gm per hundred cubic centimeters (Sahli method) or the red cell count less than 4,000,000. He was considered as having tachycardia if the heart rate was 100 or above on two or more examinations when he was at rest in bed. We studied all cases except case 11.

**Material Used and Mode of Administration.**—Nicotinic acid in crystalline form was purchased from the research laboratories of the Eastman Kodak Company and was given by various routes: (1) orally, dissolved

reddened, and the tip and the margin of the tongue were smooth and red.

On admission the patient was placed on a control diet of low pellagra-preventive value and was allowed from 4 to 6 ounces (120 to 180 cc) of whisky daily. After three days the reddening at the margin of the tongue had increased in intensity. The dermal lesions were essentially unaltered. No change was made in the diet, and nicotinic acid was administered orally in doses of 50 mg three times a day. Forty-eight hours after the initial dose the redness of the tongue had decreased considerably and by the end of the next twenty-four hours the tongue was normal. The dermal lesions healed gradually, at a rate comparable to that previously observed in patients receiving only a pellagra-producing diet. For one month the patient was kept in the hospital on the basic diet supplemented with nicotinic acid. During this period none of the manifestations of pellagra recurred and he was discharged, improved, on November 4.

**CASE 2.**—A S., a Negress, aged 65, was brought to the Cincinnati General Hospital Sept 30, 1937, in a semistuporous condition and with a story of weakness, vomiting and sore mouth. In 1932, while living in Georgia, she had had pellagra with severe mental changes and was institutionalized for

Summary of Cases

Case	Name	Age	Race	Sex	Glossitis	Stomatitis	Vaginitis	Dermatitis	Vomiting	Diarrhea	Mental Symptoms	Peripheral Neuritis	Loss of Weight and Strength	Tachycardia	Anemia	Previous Attack	Associated Disease
1	C. M.	52	W	♂	++++	+	—	++++	No	No	0	0	Yes	No	No	1	Chronic alcoholism
2	A. S.	63	B	♂	++++	++++	++++	++++	Yes	Yes	++++	+	Yes	Yes	Yes	1	Senility
3	C. P.	38	B	♂	++++	++++	—	++	No	Yes	++++	++++	Yes	Yes	Yes	?	Chronic alcoholism Korsakoff's syndrome central neuritis
4	L. H.	44	B	♀	++++	++++	++++	+++	No	Yes	++++	++++	Yes	Yes	N D	0	Chronic alcoholism Korsakoff's syndrome
5	H. D.	23	B	♂	++	++	0	0	No	No	0	0	Yes	No	N D	0	Septic abortion
6	P. L.	46	W	♀	+++	+++	—	0	No	No	0	0	No	No	N D	0	Hypertension
7	M. W.	36	W	♀	+	+	N D	0	Yes	No	0	0	Yes	Yes	No	0	Bronchopneumonia
8	B. L.	63	B	♀	+++	+++	+	+++	No	Yes	+	?	Yes	Yes	Yes	0	Senility, septicemia
9	G. S.	34	B	♀	+++	++	+	+++	No	No	0	+++	Yes	Yes	Yes	0	None
10	F. B.	82	W	♀	+++	+++	N D	0	No	No	++	0	Yes	N D	Yes	0	Senility, chronic bronchitis
11	M. H.	37	W	♀	++++	++++	N D	0	Yes	?	0	0	Yes	N D	N D	0	Rectal fistula

N D indicates no data. ++++ very severe, +++ severe, ++ moderate, + mild.

in hot water, (2) intravenously, dissolved in physiologic solution of sodium chloride so that 1 cc contained 1 mg, and (3) by hypodermoclysis, the solution just described being added directly to large amounts of physiologic solution of sodium chloride. Parenteral administration was resorted to only in cases 2, 3 and 5. No intramuscular injections were given. The dosage varied greatly, as will be seen in the individual case reports.

**Control Measures.**—All patients were hospitalized with the exception of the sixth, who was treated while ambulatory. Precautions were taken to see that they received no food known to be rich in pellagra-preventive factors either immediately before or during the nicotinic acid therapy. Some patients refused both food and water during the time of study, others received only parenterally administered fluid, while still others received a special control diet low in pellagra-preventive factors.<sup>3c</sup>

**CASE 1.**—C. M., a white man aged 52 admitted to the Cincinnati General Hospital Sept 23, 1937, complaining of sore hands, was a chronic alcoholic addict and had been treated successfully for pellagra four months previously. Two weeks before his present admission dermatitis had recurred over both hands, unaccompanied by anorexia, diarrhea, sore tongue, mental changes or neuritic symptoms.

Examination showed that the patient was very irritable and had symmetrical well demarcated erythematous lesions associated with vesicles and bullae, involving the dorsum of both hands. The buccal mucous membranes were moderately

“criminal insanity.” During the seven months prior to admission she frequently refused to eat, could not sleep and had epigastric pain on the left side, increasing weakness and loss of weight. One month before admission her tongue became red and sore. Two weeks later erythematous lesions, which gradually darkened, appeared over both hands, and her weakness had become extreme. Vomiting and diarrhea developed one week before she was brought to the hospital.

Examination showed a very ill, emaciated and dehydrated old woman in a semistuporous condition. The temperature was 99.6 F, the pulse rate 120 and the respiratory rate 20. The tongue was smooth, greatly swollen and of a fiery red color, which involved also the remaining mucous membranes of the mouth and pharynx. The tongue, as well as the gums, was covered with patchy white exudate. Bilaterally symmetrical pellagrous dermatitis was present over the hands, elbows and feet, and horny keratoses covered the nose and forehead. The vaginal mucosa was fiery red. The heart beat was rapid and the heart sounds were faint and of tic-tac rhythm.

During her first thirty-six hours in the hospital the patient refused all food and was unable to retain even fluids given by mouth. During the first fourteen hours of this period she received only physiologic solution of sodium chloride and dextrose solution parenterally. Her condition gradually became worse and she appeared moribund. Treatment with nicotinic acid was instituted at this time, 31 mg being administered intravenously over a period of five hours. Sixteen hours after the initial dose, slight improvement was detectable in the tongue. An additional 30 mg of nicotinic acid was now given by hypodermoclysis. Four hours later the intense redness of the tongue, pharynx and oral mucous membranes had



decreased remarkably and the size of the tongue was normal. The dermatitis remained essentially the same, tachycardia persisted and the patient's general condition was still critical. Since unequivocal improvement in the lesions of the mucous membrane had been demonstrated and since the patient's condition indicated that she might possibly live if fed, even against her wishes, tube feedings of materials of known potency were started. Also, parenteral injections of crystalline vitamin B<sub>1</sub>, 40 mg daily, were given. Nicotinic acid was given parenterally for an additional two days. Thereafter the patient received a high caloric, high vitamin diet. Her appetite returned and the dermal lesions and mental symptoms disappeared. November 3 she was discharged so much improved that she was able to walk the several miles to her home.

CASE 3—C P, a Negro, aged 38, admitted to the hospital Sept 30, 1937, complaining of sore tongue and abdominal pain, had been a chronic alcoholic addict for many years and for months prior to admission had eaten little food. He gave a history of long-standing diarrhea and of vesical and rectal incontinence. Three weeks before admission his mouth became sore and he noticed abdominal pain and numbness and tingling of the feet.

Examination at the time of admission showed that the patient was restless, disoriented and confabulating, with coarse tremors of the extremities and with gestures of picking at the bed clothes. The tongue was smooth, swollen and fiery red, as were the mucous membranes of the mouth and pharynx. Characteristic pellagrous dermatitis covered the hands, feet and scrotum.

Neurologic examination revealed unilateral wrist drop, paralysis of the legs, absence of ankle jerks, and strongly positive Babinski, Gordon, Oppenheim and Shattuck signs. The neurologic consultant concurred in the diagnosis of Korsakoff's syndrome and central and peripheral neuritis secondary to chronic alcoholic addiction.

During the first twelve hours after admission the patient would take only small quantities of a basic diet and his condition remained unchanged. October 1 he was given 70 mg of nicotinic acid by means of hypodermoclysis, October 2, 110 mg, and October 3, 50 mg. Twenty-four hours after the initial dose the mucous membranes were less red, and within forty-eight hours the glossitis and stomatitis were healed. The mental and neurologic symptoms persisted, however, and, in spite of parenteral injections of dextrose and saline solution and efforts to get the patient to eat a well balanced diet, his general weakness, restlessness and confabulation progressed.

With the hope of stimulating a desire to eat and of lowering the heart rate, we injected 150 mg of crystalline vitamin B<sub>1</sub> intravenously October 2 and again on October 3. Attempts to get the patient to eat various kinds of food rich in vitamins were unsuccessful. The temperature became elevated to 103 F, the pulse rate remained well above 120, respirations were rapid and shallow and the blood pressure was 138 systolic, 98 diastolic. The oral lesions did not return, but the patient died of bronchopneumonia ninety-six hours after admission.

Postmortem examination by Dr Richard Austin and Dr Isaac Kawasaki showed bronchopneumonia in all lobes of the lungs, portal cirrhosis, edema of the brain, dermal lesions of pellagra, arterionephrosclerosis and myocardial degeneration. The oral mucous membranes were normal.

CASE 4—L H, a white woman, aged 44, treated through the courtesy of Dr Roy W Scott and Dr Luther Terry of Cleveland, had been a chronic alcoholic addict for many years. Her diet had been restricted almost entirely to alcohol for the past year. When she entered the hospital she had severe glossitis, stomatitis and vaginitis, and extensive pellagrous dermatitis over the hands and the lower parts of the forearms. She had paralysis of both lower extremities and a severe Korsakoff psychosis, being disoriented as to time, place and person.

When first admitted to the hospital she was offered polished rice and corn bread but she refused to eat. On the second hospital day oral treatment with nicotinic acid, ten doses daily of 100 mg each, was begun. Within twelve hours there was striking improvement in the lesions of the mucous membrane of the mouth and the vagina. Within thirty-six hours the

membranes appeared normal. Because of the Korsakoff syndrome and general emaciation, it was then decided to give her routine antipellagra treatment. She was discharged five weeks later, with complete relief of all symptoms.

CASE 5—H D, a Negress, aged 25, treated through the courtesy of Dr Roy W Scott and Dr Luther Terry of Cleveland, had long-continued sepsis associated with high fever and anorexia. She was offered the hospital diet but refused to eat. She had moderate pellagrous glossitis and stomatitis. She was given parenteral injections of nicotinic acid in physiologic solution of sodium chloride, three doses daily of 50 mg each, for two days, and the lesions disappeared. During that period she was offered the regular hospital diet but ate only small amounts. It is inconceivable that such small quantities of food had a significant part in the healing of the pellagrous lesions. The patient recovered slowly from the septic process and was discharged, much improved, three weeks later.

CASE 6—P L, a white man, aged 46, treated through the courtesy of Dr Ogden H Baumes and Dr Harry Fry, had a normal dietary history until March 1937, when, because of albuminuria and high blood pressure, he restricted his diet to sweets, fats and vegetables and refrained from eating meat, eggs or milk. In October he noticed an abnormal red color and excruciating pain of his tongue. These symptoms progressed, and two weeks later he noticed reddening of the mucous membranes of his entire mouth and throat.

He returned to his physician November 8 and was told to eat meat. He ate about 1 ounce (30 Gm) of beef that day. We saw him on the following day and observed that his lips and the mucous membranes of his mouth were swollen and fiery red. On November 9 he was again seen and since his mouth had not improved he was given 100 mg of nicotinic acid every hour for five hours. On the morning of November 11 the tongue and oral mucous membranes appeared much improved and were no longer painful. The same dosage of nicotinic acid was repeated that day. November 12 the mouth and tongue were normal, and the patient was told to continue taking the nicotinic acid for an additional two days. He was also told to eat meat at least three times a week. He followed this regimen, but because of his fear of eating large amounts of meat he ate only an ounce three times a week, with the result that ten days later his tongue again became somewhat painful. By the end of another week the pain had increased, and the mouth and tongue became abnormally red. We saw him at this time and observed that the pellagrous glossitis and stomatitis were not as severe as during the previous attack. They disappeared after the administration of 1,000 mg of nicotinic acid.

Observations on this patient showed that the ingestion of nicotinic acid promptly produced healing of the pellagrous glossitis and stomatitis and that the patient relapsed when administration of the nicotinic acid was discontinued while he continued to take essentially the same diet.

CASE 7—M W, a Negress, aged 36, was admitted to the hospital Nov 24, 1937, with an acute infection of the upper respiratory tract of three weeks' duration. Her food intake had never been great and was limited further by the anorexia and vomiting which accompanied her present illness. Examination at the time of admission showed emaciation, acute pharyngitis, acute and chronic bronchitis, otitis media and bronchopneumonia. The tip and margins of the tongue were reddened, and an ulcerated area was present on the left side. The gums were reddened and bleeding. There were no dermal, mental or neurologic evidences of pellagra.

The patient was given water to drink and nicotinic acid 600 mg administered orally in three doses over a period of seven hours. After the administration of the nicotinic acid she noted transient tingling of her hands. Twelve hours after treatment was begun, no food whatever having been given since her admission to the hospital, the redness of the tongue had disappeared. She was then placed on a routine hospital diet. The infection of the respiratory tract and the elevation in temperature and pulse rate gradually subsided, and she was discharged, improved, December 15.

CASE 8—B L, a Negress, aged 65 was brought to the Cincinnati General Hospital Dec 5, 1937, unable to give a



coherent account of her illness. An unreliable history was obtained from her daughter. For years the patient's diet had been inadequate. She was not addicted to alcohol. For three years prior to admission she had had, over her feet and lower legs, a strange and progressive dermatitis about which she and her family could offer little information. It had failed to respond to home remedies. During the two weeks prior to admission the patient had been forced to bed by increasing weakness, and numbness and heaviness of her legs. She had stopped eating and had diarrhea, fever and involuntary urination.

Examination on admission showed that she was extremely ill, emaciated and dehydrated, was only partially oriented and lay constantly on her right side, with her extremities in a state of spastic flexion. Her tongue and buccal and labial mucous membranes were fiery red, and a patchy white exudate covered the tongue. Pellagrous dermatitis was observed over the elbows, forearms, hands and sides of the face. Over both feet and lower legs the skin was redundant, suggesting previous edema, greatly thickened and dry, and resembled a dried fungating tumor. There were large ulcerated areas with secondary pyogenic infection. Decubitus ulcers were present over the feet, right hip and elbow. Tachycardia, gallop rhythm and pulsus alternans were present. Neurologic examination was impossible to perform.

During the patient's first thirty-six hours in the hospital, treatment consisted entirely of parenteral administration of physiologic solution of sodium chloride and dextrose solution and infusion of crystalline vitamin B<sub>1</sub>. At the end of this time, though the patient's general condition was slightly improved, the temperature normal, the pulse rate down to 110 and the blood pressure 130 systolic, 86 diastolic, the lesions of the mucous membrane remained unchanged. At this time treatment with nicotinic acid was instituted, 1,100 mg being given orally in divided doses over a period of eight hours. Twenty-four hours later there was definite subsidence of the redness of the lesions of the mucous membrane of the tongue and buccal surfaces. A few hours after this definite improvement had been noted, the patient suddenly died. Post-mortem examination by Dr Richard Austin and Dr R J Ritterhoff revealed brown atrophy of the heart, an infection of the legs by an unclassified fungus, with secondary cellulitis, as well as streptococcal septicemia and healed mucous membrane lesions of pellagra.

CASE 9—G S, a Negress aged 34, was admitted to the Cincinnati General Hospital Dec 7, 1937, complaining of sore tongue, lesions over her hands and numbness of her feet. Her diet had been inadequate for a year because of lack of money. Her denial of alcoholism was verified. During a period of from two to three months before admission, lesions developed over both hands, under the breasts and about the vagina. At about the same time she noticed numbness and crawling sensations over her legs, which were worse on the left side. Her tongue, which had been slightly painful for several months, became increasingly sore, and she began to salivate profusely. These symptoms, together with weakness and dizziness, finally forced her to enter the hospital.

Examination on admission showed that she was well developed and had a temperature of 99.2 F, a pulse rate of 110 and a blood pressure of 98 systolic, 60 diastolic. The tongue was smooth and fiery red. Bilaterally symmetrical dermatitis was present over both hands, forearms, elbows and feet beneath the breasts and about the vagina and anus. The calves of both legs, but especially the left, were tender to deep pressure, and hypesthesia and hypalgesia of the left foot and lower leg were present. The vaginal mucosa was red.

On admission to the hospital the patient was given no food, and nicotinic acid was administered immediately. She received a total of 500 mg by mouth in a two hour period (five doses at half-hour intervals) during the evening of admission and 1,000 mg in five doses of 200 mg each daily thereafter. The only reactions noted were transient flushing and itching of the dermal lesions. Twelve hours after the initial administration of nicotinic acid, the patient having had no food whatever in the meantime there was definite subsidence of the glossitis and stomatitis and a decrease in salivation. Twenty-four hours later

healing of the tongue and mouth was complete and the output of saliva was normal. Food was then given for the first time, the patient being started on a control diet supplemented with 1,000 mg of nicotinic acid daily. There was no relapse of the glossitis during two weeks on this regimen, and Vincent's organisms, which had been present in large numbers on admission, practically disappeared. The dermal lesions slowly healed. Her appetite remained unchanged, and the peripheral neuritis, as manifested by pain, paresthesias and tenderness of the calves, progressed in spite of nicotinic acid therapy. Codeine was required for relief of the pain. The injection of sterile saline solution as a placebo gave her no relief, but two days after the injection of 50 mg of crystalline vitamin B<sub>1</sub> on two successive days she was able to sleep without codeine and stated that the pain had disappeared. Her appetite also improved at this time, her feeling of well being increased and within a week she stated that she felt perfectly well. She was discharged with relief of symptoms.

CASE 10—F B, a widow, aged 82, who lived alone, was treated through the courtesy of Dr Vernon Sloan and Dr Lewis Foltz at the Speers Memorial Hospital of Dayton, Ky. For a number of months prior to admission she had not eaten milk, meat or eggs but had restricted her diet mainly to starches and fats. Two months before admission bronchitis developed, and about five weeks later her tongue and oral mucous membranes became reddened. She refused food and was sent to the hospital for treatment.

Examination showed that she had senility, pellagrous glossitis and stomatitis, bronchitis and macrocytic anemia. She refused all food, and after two days of observation was given nicotinic acid orally in doses of 100 mg each five times a day. Within twenty-four hours the redness of the mouth and tongue had decreased, and within forty-eight hours the membranes were normal. The refusal to eat, anorexia, bronchitis and anemia remained constant throughout the time the improvement was taking place in the mouth. Later a desire for food developed, and she sat up in bed and became interested in getting well. At the time this report was submitted for publication she had gained in strength and was well on the road to recovery.

This patient had pellagra *sine* pellagra secondary to eating only small amounts of an unbalanced diet. The presence of bronchitis may have been a precipitating factor. The disappearance of the pellagrous element in her condition following the administration of nicotinic acid and the absence of eating indicates that nicotinic acid was important in her recovery.

CASE 11—This patient was observed by and treated under the direction of Dr David Barr of St Louis, whose summary, in full, follows:

Mrs H, a housewife, aged 37, had had an abdominal hysterectomy for myomas of the uterus six months before her admission to Barnes Hospital, three weeks after the hysterectomy an abscess ruptured into the vagina, causing drainage from the vagina, which in approximately ten days was noted to be fecal. Laparotomy was performed, and the fistulous communication between the small intestine and the vagina was closed. Because of adhesions it was necessary to do an entero-enterostomy. Approximately ten days after the operation the abdominal wound broke down and fecal drainage was noted on the abdominal dressings.

Throughout the entire illness the patient suffered from extreme anorexia and had periods of nausea and vomiting. Her diet was grossly inadequate as to calories and vitamins. Shortly after her admission to Barnes Hospital, ulcerative stomatitis and severe glossitis developed. The mucous membranes of the mouth were fiery red and there were numerous shallow ulcers scattered over their surfaces. The tongue was extremely red along the lateral margins but was coated over the dorsum. This local condition was so severe and so painful that the patient was unable to eat or drink. No dermatitis was noted at any time. The patient became very much depressed and very negativistic but probably did not exhibit any true dementia. There was more or less continuous drainage of fecal contents from the fistulous tracts, this material coming from the lower part of the ileum, so that it would be difficult to say whether or not the patient had diarrhea. She was given various supportive treatments, that is, transfusions, a high

caloric and high vitamin diet and small doses of brewers' yeast, without any apparent effect on the oral lesions

Nicotinic acid in aqueous solution was given in doses of 0.1 Gm every three hours, fifteen doses each day. Within twenty-four hours the oral lesions were considerably less injected, and the membranes were definitely resuming a more normal appearance. Within forty-eight hours all ulcers had disappeared and the mucosa appeared perfectly normal. However, there was no remarkable change in appetite during this time. During the next ten days the patient was given high caloric feedings through a nasal tube, as well as various vitamin preparations, namely brewers' yeast and liver extract. In spite of these measures she went downhill rather steadily and died.

Autopsy showed no lesions in the oral cavity nor any signs of ulceration or inflammation in the entire intestinal tract. There were several cavities in the lower lobes of the lungs, thought to be due to the aspiration pneumonia. In the lower part of the abdomen was an abscess, fairly well walled off, which communicated between the abdominal wall, the small intestine and the vagina.

The nicotinic acid seemed to have a very specific and dramatic effect on the lesions in the oral cavity. However, no appreciable change was noted in the appetite or in the patient's general condition.

#### OTHER STUDIES WITH NICOTINIC ACID

As a preliminary test for specificity, nicotinic acid was given to several patients with various types of glossitis which, before treatment with nicotinic acid was instituted, were not believed to be nutritional in origin. These included (1) a patient with irregular fiery red areas over the dorsum of his tongue, "geographic" in distribution and chronic in course, (2) a patient with painful, denuded, fiery red and furrowed, patchy lesions of the tongue which were associated with secondary syphilis and which later responded to antisyphilitic treatment, (3) two patients with lesions of the tongue, associated with tertiary syphilis, still not satisfactorily diagnosed. In no case was the tongue appreciably altered by treatment with nicotinic acid.

In two cases of classic Addisonian anemia, 50 mg of nicotinic acid daily was given by mouth, in one case the nicotinic acid had been incubated with normal gastric juice, according to the method of Castle, Townsend and Heath.<sup>5</sup> In neither case did the reticulocytes respond, and subsequent administration of ventriculin by mouth produced characteristic remissions. No cases of severe glossitis associated with Addisonian anemia were available during the period of study.

#### SUMMARY AND CONCLUSIONS

1 The lesions of the mucous membrane in eleven cases of pellagra (two of endemic pellagra, three of alcoholic pellagra and six of pellagra secondary to organic disease) were cured promptly by means of nicotinic acid. In five cases dermal lesions were absent (pellagra sine pellagra). Nicotinic acid had no apparent effect in four cases of nonpellagrous glossitis.

2 The pellagrous glossitis, stomatitis, ptyalism, vaginitis, urethritis and proctitis did not reappear while the patients received nicotinic acid, despite the fact that four of the patients continued to eat only small amounts of a pellagra-producing diet. After the disappearance of the pellagrous glossitis and stomatitis in case 6, the patient remained on the same diet but the administration of nicotinic acid was discontinued, with the result that the conditions recurred.

3 Severe cases of pellagrous dermatitis, that is those in which the continuity of the skin had become broken and the lesions were moist, ulcerated and thickened, did not seem to be specifically benefited by nicotinic acid. However, the acute fiery red, erythematous lesions in which the epithelium was intact blanched within twenty-four to forty-eight hours after the administration of nicotinic acid.

4 The manifestations of peripheral neuritis became worse in case 9 when small amounts of the basic diet and supplements of nicotinic acid were taken. The symptoms of peripheral neuritis have previously been observed to progress simultaneously with healing of the mucous membrane and the dermal lesions.

5 This study gives little information as to whether nicotinic acid is effective in the treatment of the severe mental symptoms of pellagra. It has been observed previously that such mental symptoms often disappear after persistent antipellagra therapy over a long period. The patients in this study who had mental symptoms were too severely diseased to warrant their remaining on an unbalanced diet for a sufficient period for us to determine this point with any degree of finality.

6 Studies by the method of Castle, Townsend and Heath on two patients with pernicious anemia showed that nicotinic acid is not the "extrinsic factor." It is of interest that the pellagrins included in this study excreted large amounts of porphyrin as described by the method of Beckh, Ellinger and Spies. This porphyrin is coproporphyrin I and III, both of which are abnormal in the metabolism of porphyrin. The amount of porphyrinuria diminished rapidly when nicotinic acid was administered, thus suggesting that nicotinic acid decreases the production of the abnormal porphyrin. The urine from two pellagrins in relapse was tested by Vilter, Mathews and Spies and gave a negative test for nicotinic acid when the patient was restricted to a diet devoid of nicotinic acid. Within two hours after large amounts of nicotinic acid were administered by mouth, the urine became strongly positive.

7 The maximal and minimal dosage of nicotinic acid for oral use has not been determined, but it appears from this study that 0.5 Gm daily, given in five doses of 100 mg each, is safe and effective in the usual case of pellagra. It is likely that a smaller dose will be found to be effective. Likewise, the maximal and minimal dosages of nicotinic acid for parenteral injection have not been determined. It was found that from 50 to 80 mg a day, in sterile physiologic solution of sodium chloride, was effective when injected intravenously. On several occasions hypodermoclysis of 100 mg of nicotinic acid in 1 liter of sterile physiologic solution of sodium chloride, injected slowly, was effective also.

8 These studies demonstrate that nicotinic acid is a potent therapeutic agent for treating the mucous membrane lesions of pellagra. The drug is cheap and easily administered. Further studies are indicated before it is safe to consider it as curative or preventive for the entire pellagra syndrome. It is recommended that all patients with pellagra be given a well balanced diet even when nicotinic acid is used as a supplement.

#### SUPPLEMENTARY REPORT

Since this article was submitted for publication, the following brief reports concerning the administration of nicotinic acid to pellagrins have come to our attention: 1 Fouts, Lepkovsky, Helmer and Jukes.

6 Fouts, P. J., Helmer, O. M., Lepkovsky, S. and Jukes, T. H. Proc. Soc. Exper. Biol. & Med. 37: 405 (Nov.) 1937.

<sup>5</sup> Castle, W. B., Townsend, W. C. and Heath, C. W. Observations on the Etiologic Relationship of Achylia Gastrica to Pernicious Anemia. III. The Nature of the Reaction Between Normal Human Gastric Juice and Beef Muscle Leading to Clinical Improvement and Increased Blood Formation Similar to the Effect of Liver Feeding. Am. J. M. Sc. 180: 305 (Sept.) 1930.

reported improvement in four cases of pellagra following the administration of nicotinic acid. It was the impression of these authors that complete disappearance of the dermatitis occurred more rapidly with liver filtrate than with nicotinic acid therapy. 2 V P Sydenstricker<sup>7</sup> described prompt improvement in six cases, including one that was unusually resistant to other methods of therapy, following the administration of nicotinic acid. 3 Norman Jolliffe<sup>8</sup> also stated that he obtained prompt healing of the mucous membrane lesions in three cases of pellagra. 4 Leslie Harris<sup>9</sup> stated that preliminary trials suggest that nicotinic acid seemed beneficial in pellagra. 5 Smith, Ruffin and Smith<sup>10</sup> reported a case in which they described improvement after twelve days. There was no mention of the effect of nicotinic acid on the mucous membrane lesions in this case.

Since concluding our studies reported in this article, we have treated six additional cases of pellagra. Two of the cases were treated with nicotinic acid furnished by the S M A Corporation and one by nicotinic acid furnished by Merck and Company. The mucous membrane lesions in all three cases healed within twenty-four to forty-eight hours following the administration of 500 mg of nicotinic acid. Two of the other cases were treated with 500 mg of nicotinic acid amide, and the remaining case with the same amount of sodium nicotinate. The mucous membrane lesions in these three cases also healed within twenty-four to forty-eight hours.

SURGICAL RESULTS IN THE TREATED AND UNTREATED DIABETIC PATIENT

AN ANALYSIS OF THE ALTERED PROGNOSIS IN A COMPARATIVE GROUP OF 474 CLINIC AND NONCLINIC PATIENTS

SAMUEL STANDARD, MD  
HAROLD BRANDALEONE, MD  
AND  
ELAINE P RALLI, MD  
NEW YORK

The surgical diabetic case still presents certain difficulties in treatment and still remains a problem in which the physician and the surgeon must cooperate.

In a previous report we<sup>1</sup> analyzed the results obtained in the treatment of 202 diabetic patients with surgical complications and presented a method of treatment. Since then 272 more patients have been treated. In the present paper we are reporting the results in the entire group, the modifications in treatment that have resulted from further experience and the difference in results in the clinic and nonclinic treated patients. It seems to us important to point out again the fact that, since diabetes is a chronic disease, hospitalization of the diabetic patient whether for a medical or for a surgical complication, is a temporary part of his treatment. For this reason integration between the clinic to which he goes regularly and the hospital service to which he is admitted on occasion is most important. To bring

this out, we are reporting separately, in this study, the clinic treated patient and the patient who had not previously attended any clinic or had done so sporadically, so that his diabetes was not properly controlled. This serves to emphasize also the necessity for proper control of the diabetes at all times, a fact which is often overlooked, because the disease causes but little annoyance in its milder states. The uncontrolled or partially

TABLE 1—Preoperative and Postoperative Guide for Administration of Insulin

Urinalysis	No Sugar	Sugar	Sugar and Acetone
Carbohydrate	50 Gm	50 Gm	50 Gm
Fluid	1 000 cc of physiologic solution of sodium chloride		
Insulin units	10-15	20-30	30-40

controlled diabetic patient jeopardizes his prognosis in any complication because he is never in a really satisfactory state of nutrition.

CHANGES IN THE MEDICAL TREATMENT OF THE SURGICAL DIABETIC CASE

**Diet**—We have continued to use a high carbohydrate, limited fat diet. When the operation is one of choice the patient is kept on such a diet, usually from 180 to 250 Gm of carbohydrate, from 70 to 80 Gm of protein and from 75 to 85 Gm of fat, for several days before operation. Enough insulin is given before meals to keep the patient sugar free on such a diet.

**Immediate Preoperative Treatment**—This depends somewhat on the type and length of the operation. We have found, however, that for all but minor surgical procedures an infusion of 1,000 cc of physiologic solution of sodium chloride with 50 Gm of dextrose given two hours before the operation is quite satisfactory. For minor operations 300 cc of orange juice is given by mouth one and one-half hours before the operation. A guide based on the urinalysis is used to estimate the amount of insulin required with the infusion or orange juice (table 1).

If one has had the experience of treating a patient in the clinic before any surgical complication is present, the matter of adjusting the insulin dose is a simple

TABLE 2—Surgical Complications, Yearly Incidence and Deaths in the Group of 474 Diabetic Patients

Year	Cases of Gangrene	Infections	Carbuncles	Ulcers	Other Surgical Conditions	Yearly Total	Deaths	
							Number	Per Cent
1929	11	7	4	6	1	29	7	24.1
1930	9	15	5	3	12	44	9	20.4
1931	16	22	6	1	19	64	8	12.0
1932	14	18	5	4	20	61	5	8.1
1933	15	18	6	1	11	51	9	17.6
1934	14	26	5	1	17	63	12	19.0
1935	7	29	8	3	31	78	14	17.9
1936	16	27	6	5	30	84	11	13.1
Total	102	162	45	24	141	474	75	15.8

problem. After operation it is our routine to repeat the saline infusion with dextrose in all moderately severe cases. The insulin is adjusted on the basis of analyses of the urine taken postoperatively, and the same guide as used preoperatively is followed.

In severe cases, particularly in abdominal cases in which vomiting is an important feature more than 1,000 cc of physiologic solution of sodium chloride

7 Personal communication to the author.  
8 Harris Leslie. Address before the Birmingham (England) University Biological Society, Dec. 9, 1937.  
9 Smith D T, Ruffin J M and Smith Susan G. Pellagra Successfully Treated with Nicotinic Acid. J A M A 109: 2054 (Dec. 18) 1937.  
10 From the Third (New York University) Surgical and Medical Divisions, Bellevue Hospital.  
11 Ralli Elaine P and Standard Samuel. The Treatment of the Surgical Diabetic. A Report of 202 Cases. Surg Gynec & Obst. 58: 228 (Feb.) 1934.

with 5 per cent dextrose is given. In such instances from 4,000 to 6,000 cc may be given during the twenty-four hours. As soon as the patient can take food by mouth he is fed at intervals of four hours. The feedings should contain from 25 to 50 Gm of carbohydrate. For convenience we feed the patient at 8 a m, 12 noon, 4 p m, 8 p m, 12 midnight and 4 a m. The 12 midnight and 4 a m feedings consist simply of orange juice. The other feedings consist of

TABLE 3—Results in Clinic and Nonclinic Treated Patients

	Number of Patients	Number Operated	Deaths	
			Number	Per Cent
<b>A Results of Entire Group</b>				
Clinic	172	109	12	6.9
Nonclinic	302	198	63	20.8
<b>Total</b>	<b>474</b>	<b>307</b>	<b>75</b>	<b>15.8</b>
		<b>Major Amputations</b>	<b>Deaths</b>	
			<b>Number</b>	<b>Per Cent</b>
<b>B Results of Major Amputations</b>				
Clinic		25	4	16.0
Nonclinic		45	22	49.0
<b>Total</b>		<b>70</b>	<b>26</b>	<b>37.1</b>
		<b>Number</b>	<b>Deaths</b>	
			<b>Number</b>	<b>Per Cent</b>
<b>C Results in Gangrene of Lower Extremities</b>				
Clinic		34	8	23.0
Nonclinic		68	23	41.0
<b>Total</b>		<b>102</b>	<b>36</b>	<b>35.2</b>
<b>D Results in Infections</b>				
Clinic		73	3	4.1
Nonclinic		89	18	20.2
<b>Total</b>		<b>162</b>	<b>21</b>	<b>13.0</b>
<b>E Results in Carbuncles</b>				
Clinic		9	0	0.0
Nonclinic		36	7	19.4
<b>Total</b>		<b>45</b>	<b>7</b>	<b>15.5</b>
<b>F Results in Ulcers</b>				
Clinic		10	0	0.0
Nonclinic		14	0	0.0
<b>Total</b>		<b>24</b>	<b>0</b>	<b>0.0</b>
<b>G Results in Fractures</b>				
Clinic		6	0	0.0
Nonclinic		26	1	3.8
<b>Total</b>		<b>32</b>	<b>1</b>	<b>3.1</b>
<b>H Results in Abdominal—Elective and Emergency</b>				
Clinic		24	1	2.3
Nonclinic		18	4	16.6
<b>Total</b>		<b>42</b>	<b>5</b>	<b>11.9</b>
<b>I Results in Miscellaneous Cases</b>				
Clinic		22	0	0.0
Nonclinic		45	5	11.1
<b>Total</b>		<b>67</b>	<b>5</b>	<b>7.5</b>

such articles as oatmeal gruel, ice cream, ginger ale, milk toast and egg-nog, and sugar is added to bring the carbohydrate to the desired amount. In from four to six days the patient is returned to his regular diet in a semisolid form divided into four or five feedings. Within ten days he is returned to three meals a day. The number of days that the patient remains on these frequent feedings depends on the operation and the postoperative course. Insulin is given before the feedings in amounts sufficient to keep him sugar free. This is determined by urinalyses, and again if the patient has previously been treated in the clinic the adjustment is easier.

## SURGICAL TECHNIC

The technic in elective surgery in the diabetic differs in no way from that in the nondiabetic patient. Carbuncles are treated by thorough excision and packing, followed by scrupulous cleanliness of the surrounding area at each subsequent dressing.

The "don'ts" in surgery of infections of the lower extremities in diabetic cases are well known. A tourniquet is not used, local infiltration is avoided, and strong antiseptics are not to be used. Major amputations are in most instances above the knee. A circular no-flap amputation is done and the stump is closed with drainage or left wide open, packed with gauze and sutures inserted for secondary closure five days after amputation, when the packing is removed. Amputations above the knee are used as a life saving measure. These patients are in advanced years, the average age in this group for major amputations was 63 years. They seldom wear an artificial leg and seldom return to any very active occupation.

The major problems arise in the judgment of the procedure to be used. The choice of treatment lies between palliation with moist or dry dressings, local incision and drainage, local excision of a phlegmon, amputation of a toe or a major amputation. Fixed rules are difficult to follow, but as a generality it may be said that local surgical operations are done for localized infections of toe or bone or fascial spaces, if there is evidence of adequate vascular supply to the foot. If the foot is warm, of good color, with good skin nutrition and good peripheral vessel pulsations, local surgical procedures are employed. In the face of spreading non-localized lesions such as a phlegmon of the foot with ascending cellulitis, major amputation may be done even in the presence of a good vascular supply. When there is an inadequate vascular supply, any of these may be subjected to major amputation. In the case of major amputations one is frequently confronted with the problem of a diffuse arteriosclerosis, of which the extremity is only one visible part. There is also the psychologic stumbling block. "The patient is too old, the procedure too radical, the patient may not survive surgery." Under these circumstances many factors must influence the procedure in the individual case.

## ANALYSES OF RESULTS

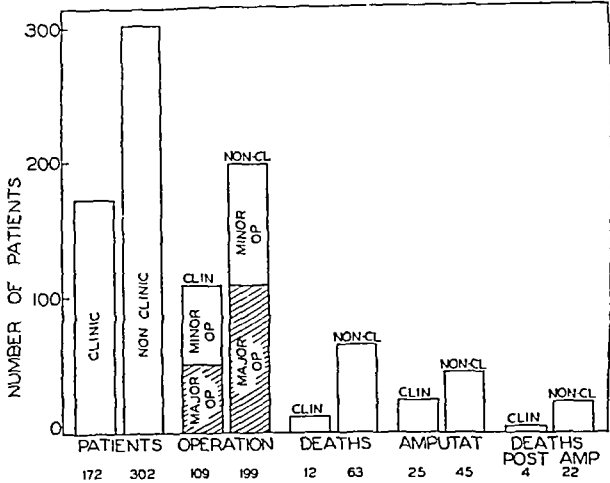
It has always been agreed as a generality that the well being of a diabetic patient in his normal course of life depends on his being maintained under diabetic control and on his being well nourished and well hydrated. If this is important under everyday circumstances, it may be assumed to be equally or even more important when a surgical complication develops. Although this is a reasonable and commonly accepted generality, there are no concrete figures to support it. For this reason in this report the group was divided into patients treated at the clinic and those not treated at the clinic, on the assumption that the former were better controlled than the latter.

Table 2 shows the types of surgical complications found in the diabetic patient, the number of patients treated yearly in the wards of the Third Surgical Division, Bellevue Hospital, and the yearly death rate in these diabetic patients. The number of diabetic patients treated yearly has increased from twenty-nine in 1929 to eighty-four in 1936. This is to be expected, because the diabetic patient has lived longer since the discovery of insulin and so surgical complications have more opportunity to develop, and also because the diagnosis

is made more frequently The decrease in the percentage of deaths is an example of the effect of the improved methods of treatment of the disease The total percentage of deaths of the 474 patients is 15.8, or seventy-five patients This includes both clinic and nonclinic patients Examination of the series of figures in table 3 shows that in the two groups the clinic deaths were 6.9 per cent, the nonclinic 20.8 per cent In the major amputation group the clinic cases had a mortality of 16 per cent, the nonclinic 49 per cent Of gangrene of the lower extremities the death rate in the clinic group was 23 per cent, in the nonclinic group 41 per cent Of infections, the clinic group had a mortality of 4.1 per cent, the nonclinic group 20.2 per cent Of carbuncles there was no mortality in the clinic group, in the nonclinic group the mortality was 19.4 per cent The other groups show the same better prognosis in the clinic treated group This is definite proof of the effect of proper control and treatment of the diabetes It seems fair as a result of these figures to state that the controlled, well treated diabetic patient is a far better surgical risk than the uncontrolled diabetic patient As far as we can determine, no other figures of this type have been published We have been able through our clinic and hospital records to follow every patient from the clinic to the hospital and back again to the clinic This analysis of the two groups explains the high surgical mortality rate in any total hospital group, as a great percentage of the diabetic patients admitted to the wards have been previously untreated for their diabetes, in many the diagnosis being made on admission

Table 4 summarizes the total group of patients and shows the incidence of the various types of complications in the clinic and nonclinic groups Gangrene was more common in the nonclinic patient In a recent study we<sup>2</sup> have shown that the incidence of infections of the feet in diabetic patients and of diabetic gangrene can be appreciably lowered by proper prophylactic care of the feet Prior to the establishment of routine care of the feet in the Third Medical Division Diabetic Clinic

We consider infection an accident in the course of the life of a diabetic patient, an accident which can to a large extent be avoided—an accident which, when it occurs, may be a relatively benign process to deal with if the patient has been previously well controlled and well nourished Such precedent control can be achieved only by keeping the diabetic patient under constant medical surveillance We believe that such control can



Graphic summary of results in entire series

be achieved in a large hospital only by an organized group in which the diabetic outpatient clinic is the hub of the organization From the clinic the patient may be referred to the medical wards for dietary adjustment or to the surgical wards for infection During his stay in the ward he is cared for by the same group, and when discharged he is referred back to the outpatient clinic There is thus no break in routine, no change in personnel The record is continuous and complete and allows for analysis of the data such as have been collected here

TABLE 4—Types of Surgical Complications Operations and Results in the Clinic and Nonclinic Treated Patients

Surgical Complications	Clinic Patients				Nonclinic Patients				Deaths				Deaths Operated Group		Deaths Nonoperative Group	
	Patients		Operations		Patients		Operations		Clinic		Nonclinic		Clinic	Nonclinic	Clinic	Nonclinic
	Patients	Patients	Major	Minor	Patients	Patients	Major	Minor	Number	Per Cent	Number	Per Cent				
Gangrene	102	34	22	4	68	41	10		8	23.5	28	41.1	7	24	1	4
Infections	162	73	2	41	89	7	44		3	4.1	18	20.2	3	18	0	0
Carbuncles	46	9	6	0	36	31	1		0	0.0	7	19.4	0	7	0	0
Ulcers	24	10	2	0	14	1	4		0	0.0	0	0.0	0	0	0	0
Fractures	32	6	0	4	9	0	17		0	0.0	1	3.8	0	0	0	1
Abdominal	42	18	12	2	24	20	0		1	2.3	4	16.6	1	2	0	2
Miscellaneous	67	22	6	8	45	10	12		0	0.0	5	11.1	0	0	0	5
Totals	474	172	50	50	302	110	88		12	26.9	63	20.8	11	51	1	12

at Bellevue Hospital it had been necessary to hospitalize 10 per cent of the patients attending the clinic for infections of the feet In the two years following the establishment of foot care in the clinic, it was necessary to hospitalize only 4.6 per cent in spite of a 70 per cent increase in the total census of the clinic The striking difference in the number of deaths in the two groups is partly due to the prophylactic care of the feet and partly to the improved state of nutrition of the clinic controlled diabetic patient The latter also is probably responsible for the difference in the number of deaths in the infection and carbuncle groups

2 Brandileone Harold Standard Samuel and Ralli Elaine P Prophylactic Foot Treatment in Patients with Diabetes Mellitus Ann Surg 105 120 (Jan) 1937

SUMMARY

- 1 In a group of 474 surgical diabetic patients, 172 were previously treated in the diabetic clinics of the medical service
- 2 The mortality in the total group was 15.8 per cent, but in the clinic treated group the mortality was 6.9 per cent, while in the nonclinic group it was 20.8 per cent
- 3 The lower mortality in the clinic group was present in all the surgical complications It was particularly striking in the patients requiring major amputation, whereas in the clinic group the mortality was 16 per cent, in the nonclinic group it was 49 per cent

477 First Avenue

## SULFANILAMIDE THERAPY IN MENINGOCOCCIC MENINGITIS

LEON J WILLIEN, M D

KNOXVILLE, TENN

Following the favorable preliminary report by Schwentker, Gelman and Long,<sup>1</sup> I began the use of sulfanilamide for meningococcic meningitis

Five cases and one recurrence are reported here. There was no selection of cases, the infection varied from moderate to severe intensity, the ages of the

TABLE 1—Course in Case 1

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
4/27/37	4 267	76	Positive	15 cc of 0.8% solution intraspinally 150 cc of 0.8% solution subcutaneously 6 grains every four hours by mouth
4/28/37	640	82	Negative	As above
4/29/37	507	75	Negative	As above
4/30/37	288	50	Negative	As above
5/ 1/37				5 grains every four hours by mouth
5/ 2/37				5 grains every four hours by mouth
5/ 3/37	112	62	Negative	As on 4/27/37
5/ 4/37				None, clinically cured

patients were from 1½ to 26 years. Since the site of the disease in meningitis is accessible by spinal puncture and the actual exudate of the affected part can be seen, measured, studied and counted, this disease is one of the few in which clinical bedside results can be correlated and confirmed by laboratory examinations. The error of human judgment and enthusiasm is, so to speak, counterbalanced by the results of examination

TABLE 2—Course in Case 2

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
4/30/37	2,560	66	Positive	200 cc of 0.8% solution subcutaneously, 15 cc of 0.8% solution intraspinally
5/ 1/37	No puncture			None
5/ 2/37	No puncture			5 grains every four hours by mouth
5/ 3/37	240	68	Negative	200 cc of 0.8% solution subcutaneously 20 cc of 0.8% solution intraspinally 5 grains every four hours by mouth
5/ 4/37	No puncture			As on 5/2/37
5/ 5/37	240	6	Negative	As on 5/3/37
5/ 6/37	240	10	Negative	20 cc of 0.8% solution intraspinally 5 grains every four hours by mouth
5/ 7/37	No puncture			5 grains every four hours by mouth
5/ 8/37	No puncture			5 grains every four hours by mouth
5/ 9/37	No puncture			5 grains every four hours by mouth
5/10/37	No puncture			5 grains every four hours by mouth
5/11/37	112	8	Negative	5 grains every four hours by mouth
5/12/37	No puncture			Discontinued

in the pathologic laboratory. My results are summarized in the accompanying case reports. The clinical observations paralleled those of the laboratory.

The technic of these authors<sup>1</sup> was used at first and after confirming their results I began the use of sulfanilamide by oral administration alone following an initial subcutaneous injection that was given to

saturate the body tissues and to build up a high concentration in the blood.

There is still confusion among clinicians regarding the mode of administration and dosage of sulfanilamide. As I feel that a meningococcic infection is as severe as any infection that clinicians will elect to treat with sulfanilamide, the pharmacology of the drug as applied to clinical use will be given in some detail.

My technic of administration of sulfanilamide is based on a consideration of the absorption and excretion of the drug as reported by Marshall, Emerson and Cutting.<sup>2</sup> They found that

1 Absorption is in most instances complete in man in about four hours. For this reason, if the daily dose is to be divided in order to attempt to maintain a nearly uniform concentration in blood and tissues, a four hour interval between doses would appear to be indicated.

2 If it is desired to reach quickly a high blood concentration and maintain it, a large single dose (e g, 0.05 Gm per kilogram) could be given and followed by the usual dose every four hours.

TABLE 3—Course in Case 3

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
5/ 3/37	5 650		Positive	100 cc of 0.8% solution subcutaneously 20 cc of 0.8% solution intraspinally 5 grains every four hours by mouth
5/ 4/37	22 613			As above
5/ 5/37	7,980			10 cc of 0.8% solution intraspinally 5 grains every four hours by mouth
5/ 5/37	1 128			Acidosis, cyanosis and morbilliform rash; drug discontinued
5/ 6/37	811			No treatment
5/ 6/37	1 280		Negative	5 grains every four hours by mouth
5/ 7/37	331			5 grains every four hours by mouth
5/ 8/37	No puncture			5 grains every four hours by mouth
5/ 9/37	No puncture			Therapy discontinued
5/10/37	68		Positive	No treatment
5/11/37	31			No treatment
5/12/37	No puncture			No treatment
5/13/37	50		Negative	No treatment
5/14/37	No puncture			No treatment
5/15/37	Bloody tap			Discharged

3 The finding of the drug in spinal fluid in only slightly lower concentration than in blood within a few hours of administration by mouth suggests that the drug may be given by mouth when its presence in the spinal fluid is desired.

Based on these observations, a routine of administration of sulfanilamide was evolved which is applicable in any of the severe coccic infections.

1 An initial subcutaneous injection of a large dose of the saturated (0.8 per cent) solution is given in amounts approximating 0.05 Gm per kilogram.

2 The drug is administered by mouth every four hours day and night.

3 The dosage is graduated downward from an upper limit of 15 grains (1 Gm) every four hours depending on the size and age of the patient and the severity of the infection.

4 The drug is continued, in reduced dosage, for about ten days after symptoms and laboratory readings have returned to normal (this being in accord with the pharmacologic finding that the drug is bacteriostatic rather than bactericidal).

5 Sodium bicarbonate is given grain for grain with sulfanilamide in order to combat acidosis.

1 Schwentker, F. F., Gelman, Sidney and Long, P. H. The Treatment of Meningococcic Meningitis with Sulfanilamide. J. A. M. A. 108 1407 (April 24) 1937.

2 Marshall, E. K., Jr., Emerson, Kendall, Jr. and Cutting, W. C. Para Aminobenzenesulfonamide. J. A. M. A. 108 253 (March 25) 1937.

6 Magnesium or sodium sulfate is not given in order to prevent sulfhemoglobinemia

## REPORTS OF CASES

CASE 1—E G, a Negro girl, aged 11 years, admitted March 28, 1937, received 310,000 units of meningococcus antitoxin intravenously and 45 cc of serum intraspinally from March 31 through April 15. No treatment was given from April 16 to April 26 in order to eliminate any cellular response in the spinal fluid that could be attributed to a reaction to either intravenous or intraspinal therapy.

During this time the temperature ranged from 104 to 98.0 F and the spinal fluid cell count from 13,227 to 2,560. Repeated cultures of the spinal fluid were positive for meningococci and clinical symptoms matched the laboratory changes in severity. The last spinal puncture (April 16) before the institution of sulfanilamide therapy revealed a cell count of 4,979 and a positive culture for meningococci.

Observation at intervals since discharge shows that she has remained well.

CASE 2—D W, a Negro youth, aged 16 years, admitted March 21, 1937, received a total of 610,000 units of men-

TABLE 4—Further Course in Case 3

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
5/20/37	14,500		Positive	100 cc of 0.8% solution subcutaneously 10 grains every four hours by mouth
5/21/37	8,152	81	Positive	10 grains every four hours by mouth
5/22/37	2,220	96		5 grains every four hours by mouth
5/23/37	213	88	Negative	5 grains every four hours by mouth
5/24/37	No puncture			5 grains every four hours by mouth
5/25/37	123	48	Negative	5 grains every four hours by mouth
5/26/37	No puncture			5 grains every four hours by mouth
5/27/37	48			5 grains every four hours by mouth
5/28/37	No puncture			5 grains every four hours by mouth
5/29/37	No puncture			5 grains every four hours by mouth
5/30/37	No puncture			Discontinued
5/31/37 to 6/ 6/37	No puncture			No treatment
6/ 7/37	21	10		No treatment
6/ 8/37	No puncture			No treatment
6/ 9/37	Discharged cured			

ingococcus antitoxin from March 21 through April 19. 82.5 cc of one brand of serum and 30 cc of another brand. Treatment was not given from April 20 through April 29 in order to eliminate any cellular response in the spinal fluid that could be attributed to either intravenous or intraspinal therapy.

During this time the spinal fluid cell count ranged from 25,000 plus to 1,792 with repeated positive cultures for meningococci. Clinically the patient was unimproved. The last spinal puncture (April 19) before the institution of sulfanilamide therapy revealed a cell count of 6,742 and a positive culture for meningococci.

CASE 3—O M J, a white girl, aged 3 years, admitted May 2, 1937, had been severely ill for twenty-four hours with acute signs and symptoms of meningitis. Diagnosis of meningococcic meningitis was confirmed by spinal puncture and laboratory examinations.

The patient was readmitted May 20, 1937, with a recurrence due to insufficient length of time of sulfanilamide administration. She was severely ill with a convulsion on admission.

Observation at intervals since discharge from the hospital shows that she has remained in good health.

CASE 4—R B S, a white girl, aged 18 months, was admitted May 24, 1937, with acute signs and symptoms of meningitis. The diagnosis was confirmed by spinal puncture and laboratory examinations. Blood culture taken on admission showed a growth of meningococci. The patient was severely ill.

Although the patient has not been under observation since discharge, the reports are that she is in good health.

CASE 5—Mrs E W, white, aged 26, was admitted May 31, 1937, with signs and symptoms of meningitis. Diagnosis of meningococcic meningitis was confirmed by spinal puncture and laboratory examinations. The patient was moderately ill.

The patient has not been observed since her discharge from the hospital.

TABLE 5—Course in Case 4

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
5/24/37	20,000		Positive	100 cc of 0.8% solution subcutaneously 5 grains every four hours by mouth
5/25/37	20,000		Positive	5 grains every four hours by mouth
5/26/37	6,307			5 grains every four hours by mouth
5/27/37	1,193		Positive	5 grains every four hours by mouth
5/28/37	299	88	Positive	5 grains every four hours by mouth
5/29/37	229		Positive	5 grains every four hours by mouth
5/30/37	No puncture			5 grains every four hours by mouth
5/31/37	106	80	Negative	5 grains every four hours by mouth
6/ 1/37	No puncture			5 grains every four hours by mouth
6/ 2/37	69	80	Negative	5 grains every four hours by mouth
6/ 3/37 to 6/ 5/37	No puncture			5 grains every four hours by mouth
6/ 6/37	90	80		5 grains every four hours by mouth
6/ 7/37	No puncture			5 grains every four hours by mouth
6/ 8/37	92	62	Negative	5 grains every four hours by mouth
6/ 9/37	No puncture			Treatment discontinued
6/10/37 to 6/14/37	No puncture			No treatment
6/15/37	50	56	Negative	No treatment
6/16/37 to 6/18/37	No puncture			No treatment
6/19/37	38	60	Negative	No treatment discharged cured

TABLE 6—Course in Case 5

Date	Cell Count	Per Cent Polymorpho nuclears	Culture	Sulfanilamide
5/31/37	504		Positive	100 cc of 0.8% solution subcutaneously 15 grains every four hours by mouth
6/ 1/37	No puncture			15 grains every four hours by mouth
6/ 2/37	101	60	Negative	15 grains every four hours by mouth
6/ 3/37	175	80	Negative	15 grains every four hours by mouth
6/ 4/37	146		Negative	15 grains every four hours by mouth
6/ 5/37 to 6/10/37	No puncture			15 grains every four hours by mouth
6/10/37	58	10	Negative	15 grains every four hours by mouth
6/11/37	No puncture			10 grains every four hours by mouth
6/12/37 to 6/19/37	No puncture			10 grains every four hours by mouth
6/20/37	26		Negative	Treatment discontinued
6/21/37 to 6/23/37	No puncture			No treatment
6/26/37	54	5		No treatment
6/27/37	Discharged cured			

## COMMENT

The clinical response of the patients to treatment with sulfanilamide was satisfactory in every case. The possibility of being able to cure meningococcic meningitis by the administration of sulfanilamide by mouth only will be of untold benefit by eliminating the time, trouble and expense of intraspinal and intravenous therapy, together with the elimination of the danger of protein shock and the discomfort of serum sickness.



The economic saving is of great importance. Serum and/or antitoxin, hospital and nursing bills quickly mount to a sum that is too much of a financial burden for the average patient. The elimination of several hundred dollars expense for serum or antitoxin will make this burden easier to carry. An example of this is clearly shown in case 2. A total of 610,000 units of antitoxin was administered, 82.5 cc of one brand of serum and 30 cc of another brand, over a period of forty-one days of treatment and at a cost of over \$500 for the serum and antitoxin alone, which had failed to effect a cure. Two dollars worth of sulfanilamide effected a cure in a period of fourteen days.

A reaction characterized by acidosis, cyanosis and a morbilliform rash over the extremities was observed in case 3. This subsided promptly in less than twenty-four hours after the drug was discontinued. No other reactions were observed in any of the cases.

I believe that continuing the drug in reduced dosage for a period of from ten days to two weeks after symptoms of the disease subside is very important, as the drug is bacteriostatic rather than bactericidal, and recurrences such as occurred in case 3 are likely.

#### CONCLUSIONS

Sulfanilamide has been used in the treatment of both acute and chronic cases of meningococcic meningitis. The response to treatment by all patients was satisfactory, even with oral administration alone.

### REMISSIONS OF ATTACKS IN EPILEPSY TREATED WITH SODIUM BROMIDE

LEWIS J. POLLOCK, M.D.  
CHICAGO

The effects of medication on epileptic seizures have been described, perhaps redundantly. In many instances a diminished number of attacks or lessened severity has constituted proof of the efficacy of a drug. Any sedative may be expected to accomplish this. To be really efficacious a drug should stop all attacks for long periods of time or, better, for the duration of its administration.

In this report a study is made to determine the number of cases in which all attacks have been stopped for the duration of treatment with sodium bromide and the duration and character of remissions brought about when attacks occurred at times during the period of treatment.

All private patients suffering for a period of more than four months from a convulsive disorder who reported to me at regular intervals during the year of January 1936-January 1937 have been selected as a group for study. There were ninety-six such patients. Of these, eighty-five had been treated for more than a year, some had been observed for many years. Of the ninety-six patients, ten suffered from petit mal attacks alone, twenty-seven from grand mal attacks alone and forty-one from both. Focal attacks occurred in eighteen cases, in seventeen of these the seizures were of a grand mal type. By focal attack it is meant that the aura or the attack itself indicated some focal abnormality. For example, attacks with a gustatory aura, a hemipic visual one or a segmental sensory one,

or jacksonian or other attacks with segmental or localized motor manifestations were included in this group.

In thirty-three cases there was a history of some preceding infection, other disease or injury which might be related temporally with the onset of the disease. In five additional cases the focal character of the attacks suggested the possibility of an organic local change in the brain. Of the thirty-three cases there were sixteen with a history of an encephalitis or encephalopathy associated with infectious diseases during infancy and childhood, four cases of brain tumor, one suspected brain tumor, one cerebral abscess, five injuries at birth, four other cranial injuries and three which developed during pregnancy.

#### ATTACKS STOPPED FROM THE BEGINNING OF TREATMENT

Of the whole material of ninety-six cases, all attacks were stopped from the beginning of treatment in twenty-eight. Five patients had been treated less than a year. In six the seizures were stopped more than a year, in five more than two years, in one more than three years, in two more than four years, in one more than five years, in three more than seven years and in five more than eight years.

In seven other cases the attacks ceased shortly after the beginning of treatment and have not recurred, in three under a year, in one over three years, in two over two years and in one over one year.

Final remissions beginning with the institution of treatment or shortly afterward occurred in thirty-five cases, or 36 per cent.

In thirty-five other cases, remission of attacks occurred, then attacks returned and again disappeared. In thirteen the duration of the last remission was less than five months, in ten from five to twelve months, in four over one year, in five over two years, in two over three years and in one over four years.

In the entire group remissions were reported at the last visit in seventy cases (72.9 per cent), in thirty one of less than a year, in twelve from one to two years, in eleven from two to three years, in four from three to four years, in three from four to five years, in one from five to six years, in three from seven to eight years and in five over eight years.

Eleven of the thirty-nine patients with a final remission of less than a year were treated less than a year. In the cases treated more than a year (eighty-five) final remissions occurred in sixty-three, or 74 per cent, and have lasted more than a year in thirty-nine, or 45.8 per cent.

Final remissions of over a year were brought about in 45.8 per cent of eighty-five cases treated over a year.

In many cases when the final remission was less than a year, remissions of much longer duration had occurred before. In a group of twenty-two patients with a final remission of less than five months, eighteen had had remissions of over one year. Of these there were one over ten years, one over nine years, one over eight years, one over seven years, one over six years, one over five years, three over three years, three over two years and six over one year.

Of eighty-five patients treated longer than a year, remissions of more than a year were brought about in sixty-one cases, or 71.7 per cent. There were seven remissions of between one and two years, twelve between two and three years, eight between three and four years, five between four and five years, three

between five and six years, two between six and seven years, four between seven and eight years, six between eight and nine years, one between nine and ten years and three more than ten years

Remissions of more than one year were brought about in sixty-one cases of eighty-five treated over a year, or 71.7 per cent. In some the remissions lasted more than ten years, with a mean of between three and four years

Of the total of ninety-six cases, remissions were brought about in seventy-eight, or 83.4 per cent. In eighteen cases the treatment was completely ineffectual (18.7 per cent)

#### CHARACTER OF ATTACKS AND REMISSIONS

*Grand Mal*—Forty-four patients at the beginning of treatment suffered from grand mal attacks only. In seventeen the attacks were focal. In nineteen the attacks stopped from the beginning of treatment (43 per cent), the duration of the remissions being over seven years in one, over five years in one, over four years in one, over three years in three, over two years in four, over one year in six and under one year in three, with a median of two years. A final remission occurred in twenty-seven cases (61 per cent), the median of the duration being two years. Remissions were brought about in thirty-four cases (77 per cent) and of over one year in twenty-eight cases (63.6 per cent)

In nine cases petit mal attacks began after institution of treatment

There were thirty-three patients suffering from grand mal attacks only who had been treated for over one year, in them remissions of over one year were brought about in twenty-eight cases (84.5 per cent). In twenty a final remission of over one year had been brought about (60.6 per cent). Remissions occurred in thirty, or eighty-nine per cent. In fifteen the attacks were stopped from the beginning (42.4 per cent)

Of the twenty-seven patients suffering from grand mal attacks only, which were not focal, the attacks were stopped in twenty (74 per cent), in three when the grand mal attacks stopped, petit mal attacks began, in three there were long remissions of grand mal attacks but petit mal attacks began, in four there were long remissions. Petit mal attacks began in six of the twenty-seven cases. In this group remissions were brought about in all cases

In patients suffering from grand mal attacks only the attacks were stopped in 43 per cent. When attacks of a focal character were excluded, attacks were stopped in 74 per cent. Petit mal attacks began in 20 per cent of cases

Of the ninety-six patients, eighty-five suffered from grand mal attacks alone or combined with petit mal attacks. Of the eighty-five the grand mal attacks stopped from the beginning in thirty-nine (45.8 per cent) cases, in thirty-three for a period of more than a year (35.2 per cent) and up to twelve years. A final remission occurred in sixty-three (74 per cent), over a year in forty-nine (57.7 per cent), there were seventy-four remissions (87 per cent), in sixty-five of over a year (76.4 per cent)

*Petit Mal*—Of the ninety-six patients, fifty-one suffered from petit mal attacks alone or combined with grand mal attacks. Of these in twenty-one the attacks were stopped from the beginning (41 per cent), in seventeen for over a year up to twelve years (33 per cent). There were thirty-eight cases (74 per cent)

presenting final remissions and in twenty-eight (55 per cent) of these the remissions had lasted over a year, in forty-two (82 per cent) cases remissions were brought about, in thirty-four (66 per cent) of over a year

Ten patients at the beginning of treatment were suffering from petit mal attacks alone. In four the attacks stopped from the beginning, in two there were final remissions, and four were unaffected

Although petit mal attacks may begin when attacks of grand mal cease under treatment, and be refractory to treatment, in general the response to treatment is only slightly less favorable than that of grand mal attacks

*Focal Attacks*—There were eighteen patients suffering from focal attacks. In one they were associated with petit mal attacks. In this case the petit mal attacks ceased and there was a long remission of the focal attacks. In three the focal attacks were stopped from the beginning (16.6 per cent). In one of these petit mal attacks began and could not be controlled. A final remission occurred in four cases (22 per cent), but in two of these petit mal attacks began. In only three cases were all attacks stopped for fourteen, thirty-seven and fifty-eight months respectively (16.6 per cent). In ten (55.5 per cent) treatment was ineffectual

Of all cases, those presenting focal attacks are most resistive to treatment, it being ineffectual in 55.5 per cent

#### THE RELATION OF THE CAUSES OF THE DISORDER TO REMISSIONS

In thirty-three of the cases the cause of the disorder was attributed to a disease or injury of the brain. In three the attacks began during a toxemia of pregnancy. In fifteen they were attributed to encephalitis of childhood. In these cases an interruption of intellectual or motor development coincident with the infectious disease, prolonged convulsions or onset of paresis or paralysis during the disease constituted the criteria for establishing the relationship. In five birth injury and in four subsequent cerebral injury was the cause. There were four cases of verified brain tumor. In all the presenting signs and symptoms were insufficient to establish the diagnosis of tumor at the time the patient applied for relief of the convulsive disorder, and in some cases a number of years elapsed before a correct diagnosis was established. There was one tumor suspect and one case of a healed brain abscess

Of the whole group of thirty-three, the attacks were stopped from the beginning or shortly after in six, or 18 per cent, compared to 36 per cent in all ninety-six cases. Other final remissions number two, making a total of eight, or 24 per cent, compared to 72.9 per cent of the whole ninety-six cases. There were fourteen additional long remissions of all attacks, making a total of twenty-two remissions in all, or 66 per cent compared to 81 per cent of the ninety-six cases. In two cases there was a remission of only the grand mal attacks and in one only a short remission of both grand and petit mal attacks. There were ten cases in which the treatment was ineffectual, or 30 per cent compared to 18.7 per cent in the ninety-six cases. Of these the attacks were of a focal character in six. This seems to indicate that the focal nature of the attacks more than the cause is responsible for the inefficacy of treatment, although, in injury or disease of the brain, seizures do not respond to treatment as well as in supposedly functional disease

In the group of fifteen cases due to encephalitis there were remissions in twelve, or 80 per cent. In all three cases beginning during pregnancy and in all four cases of verified tumor, remissions were brought about. In three of five cases of birth injury and in none of the four cases of subsequent cerebral injury were long remissions brought about. All of the latter patients had attacks of a focal character.

If the thirty-three cases presumably due to disease or injury of the brain were excluded from the general group of ninety-six cases, the number of cases unaffected by treatment would be eight, or 12.8 per cent.

In cases in which disease or injury of the brain was presumably the cause of the convulsive disorder, treatment was less effectual.

#### THE RELATION OF THE DURATION OF REMISSIONS TO POSSIBLE CESSATION OF ATTACKS

Casual observation of the course of patients being treated had led me to the belief that if a patient can be kept free of convulsions for a period of four years the medication may be gradually diminished and finally discontinued. It became evident from this study that such an opinion is fallacious.

In forty-three cases with remissions and exacerbations, there were immediate remissions in thirty-four cases in four for a period of over nine years, one of them for fifteen years, in one over eight years, in one over six years, in two over five years, in two over four years, in three over three years, in four over two years and in nine over one year. In ten cases with a remission of over four years, attacks recurred for one or another reason, in many because medication was discontinued but in some despite medication.

When remissions are brought about, medication must be continued during the life of the patient.

#### FACTORS BEARING ON REMISSIONS

Although former analyses of larger and usually different material seemed to indicate a relation between age, duration of disease and number of previous attacks to prognosis, in this small material there was no such correlation—with one exception. Of the twenty-five cases in which the attacks had been promptly stopped and did not recur, there were seventeen cases with a duration of the disease of two years or less (68 per cent). Of the thirteen cases presenting only grand mal attacks in the group of twenty-five with prompt remissions, in twelve there had been a maximum of less than nine attacks. However similarly few attacks were observed in other less favorably affected groups.

It is suggested that early treatment and few previous attacks lead to more prompt and continued remissions.

#### CONCLUSIONS

1 Final remissions beginning with the institution of treatment or shortly after occurred in thirty-five of ninety-six cases (36 per cent).

2 Final remissions of over a year were brought about in 45.8 per cent of eighty-five cases treated over a year.

3 Remissions of over one year were brought about in sixty-one cases of eighty-five treated over one year, or 71.7 per cent. In some the remissions lasted over ten years with a mean of between three and four years.

4 In patients suffering from grand mal attacks only the attacks were stopped in 43 per cent, when attacks of a focal character were excluded, attacks were stopped in 74 per cent. Petit mal attacks began in 20 per cent of cases after treatment was instituted.

5 Although petit mal attacks may begin when attacks of grand mal cease under treatment, and be refractory to treatment, in general the response to treatment is only slightly less favorable than that of grand mal attacks.

6 Of all cases, those presenting focal attacks are most resistant to treatment, it being ineffectual in 5.5 per cent.

7 In cases in which disease or injury of the brain was presumably the cause of the convulsive disorder, treatment was less effectual.

8 When remissions are brought about by treatment, it must be continued throughout the life of the patient.

9 It is suggested that early treatment and few previous attacks lead to more prompt and continued remissions.

25 East Washington Street

### THE PSYCHIATRIST'S RESPONSIBILITY TO THE CRIMINALLY INSANE AND TO SOCIETY

FOSTER KENNEDY, M.D., F.R.S. (Edin.)

NEW YORK

There are three protagonists in law trials in which an alleged insane person is either in the box or at the bar—the judge, the alleged insane person and the doctor. One can look at the problem from all three points of vision. There is an unseen fourth—the public, made articulate by the press.

Our forefathers fought for the recognition of individual rights. Runnymede and Magna Charta, the Bill of Rights, the struggle with the crown, the lopping off the anointed head that bore it, the continuation of that same struggle in America with the victory of the people, the reform bill of 1832—the present day liberties of each of us have been bought by struggle and by sacrifice. The Great War was in essence a fight for individualism against suppressing organized government, as represented by Prussia, and only the other day, ten years ago, another struggle, bloodless but bearing even graver issues for civilization than did the Great War, was the general strike in Britain in which the whole work of labor stopped dead. That struggle finally affirmed the rights of the great mass against the efforts of a minority to throttle the nation. We have had won for us by these efforts of our forefathers, of our brothers and recently of our own, such an individual consciousness, such a respect for individual rights, that we have rather lost sight of the rights of society as a whole. We have been so glamored by our desire to safeguard the liberty of the person that we have become negligent of the safety of the mass.

#### FAILURE TO PROTECT SOCIETY AGAINST THE MAN OF VIOLENCE

Society, in short, in America has been failing to protect itself against rampant individualism, as expressed by the man of violence. During last year there were over eleven thousand homicides in this country. That is a fifth of the total loss of the American forces sustained through both natural causes and at the hands of the enemy in nineteen months of first-class modern warfare.

The police force and the law courts are tardy instruments in the apprehension of the perpetrators of the majority of these crimes, but when they have been

apprehended we medical men are often made another brake on the slow wheel of justice, and we abet the sentimentality of the press by being asked to testify in and out of season to the lack of responsibility of the criminal. Law is an instrument for the protection of society. It is not a clinic.

Medicine has been in the past century an instrument for the protection of the individual. For twenty-five years, however, our profession has had a new orientation. Our greatest achievements have been in prophylaxis and in the maintenance of sound public health. So too in psychiatry we have to try to procure a prophylactic point of view by examining the heredity and environmental stresses of our insane, to try to comprehend their problems and to aid in their adjustment. But this effort of mental hygiene must not blind us to the fact that in truth we have no knowledge regarding the nature of mind. The issue between Plato and Aristotle, between the Vitalists and the Materialists, between Function and Structure is not yet determined. We do not know whether the mind is a thing dwelling, as the parsons tell us, in the temple of the body or whether it is the supreme function of the body. We know for certain that it works through the body and is susceptible of change by changes in the body. Mind, I believe myself, is to the body as the function of sight is to the eye. An examination of mind without an examination of the body is the examination of sight without the examination of any of the apparatus for sight, and that is an investigation of visual esthetics but not an examination of sight.

To abolish or mitigate mental and moral ills we have to do more than the priestly function of individual psychoanalysis. We have somehow or other to try with as much wisdom as our little knowledge gives us to deal with heredity, and we must do something toward the segregation and the prohibition from increase of the proved unfit—and a very important word is "proved." In the criminal courts the sentimentality of the public, to some extent the notion of mental hygiene and humanity in the doctor, and a nonwarranted sense of knowledge about things mental and psychiatric in the judge tend to reverse these aims. We are protecting the individual criminal from society, when society has as yet made no plans whereby in the event of release on present charges the criminal may be prevented from antisocial acts in the future. Psychiatry cannot properly work through the existing criminal codes. Justice is diverted by the absurdity of hypothetical questions. Twelve laymen cannot be expected to appraise nicely the degree of responsibility of a paranoiac or a high grade moron, and the differences of opinion between lawyers and doctors, and doctors and doctors, buttressed, if not directed, by funds from opposed interests, gossiped in the corridors and wrangled in the courts, elevate crime, debase law and prostitute medicine.

#### RESPONSIBILITY FOR CRIME

The real point at issue in a trial in which the defense is a plea of insanity is not whether or not the mind was unsound but whether it was sufficiently unsound as to be unable to determine right from wrong, or the nature of the act. If not, was the accused a victim of so uncurbable an impulse to commit the crime as to ignore the ordinary social inhibitions and be forced thereby heedlessly to jeopardize his own safety?

Irresistible impulse has a place in medicine. It is right that it should have a place in law. But it is rare in medicine and I think in the courts still rarer.

The definition of "irresistible impulse" as a proper legal plea to acquit an individual of responsibility for an act would seem to me to be, it has been done under the whip of delusion or hallucination or done during absence of consciousness in an automatic state. One may argue that a killer frenzied with anger is possessed by an uncurbable or even irresistible impulse, my answer is that blind wrath is usually not quite blind and is commonly conquered and that sudden impulses to slay are more often felt by ordinary persons than they confess to any but their doctors. These emotional vestigial remnants of our past are generally mastered, their existence in us cannot be denied, otherwise we could not possibly overnight make soldiers out of piano-tuners by simply decreeing murder as once again honorable and of good repute. Let me cite the instance of Lord Bramwell, who, when the irresistible impulse plea rose before him, asked "Would the defendant have taken the umbrella had a policeman been present?" The lawyer's answer was "no." "Well," said Bramwell, "you plead then that the impulse was irresistible in the absence of a policeman." To many people the very fact of a crime having been committed has come to be *prima facie* evidence of the insanity of the criminal. Every crime might be said and is said, by defending lawyers and often sympathetic laymen to be committed under uncurbable impulse. The object of law is surely to compel people who can to control the expression of this impulse.

The whole question of responsibility for crime has been moot between lawyers and medical men. Legal dicta have been incorporated into the body of the law from the time of Lord Erskine, who directed the jury that "to protect a man from punishment there must be such a prostration of intellect that he does not know his own name nor condition, nor his relation towards others," to the time of the M'Naghten case in 1843, when it was laid down that "a defendant is punishable if he knew at the time of the crime that he was acting contrary to law and ethics, that for a defense it must be proven that he was so defective in reason as not to know the nature and quality of his act, or if he did know it, he did not know it to be wrong." We should, I believe, amend this ruling to indicate the degree of restraint of a criminal impulse of which the accused is judged capable. Nowadays we have come to the place where calcification of the pineal gland has lately been gravely put forward as a reason why a criminal of some eighteen years should be shown preferential treatment for his murderous peccadillos!

The whole system whereby a defendant employs and pays for medical opinion in the courts is wrong and should be abolished. I can see no reason why a defendant should have any more constitutional right to pick his medical expert than he has to pick the policeman who arrests him or the judge who presides at his trial.

A friend of mine, Judge Clarke in New Jersey, was lately spoken to sharply in his court by a man with a foreign accent who protested against Judge Clarke's ruling on the ground that he, the judge, was unfair in that he was clearly prejudiced in favor of the United States!

Acquittal on account of a mental disease or semi-mental disease is often a feeble release of wolves to prey on the people and should no longer be tolerated. The following program is surely one for ardent hope.

1 That in all cases of felony or misdemeanor punishable by prison sentence, the question of responsibility be

not submitted to the jury, the jury will thus be called on to determine only that the offense was committed by the defendant

2 That the disposition and treatment (including punishment) be based on a study of the individual offender by properly qualified and impartial experts cooperating with the courts

3 That no maximum term be set to any sentence

4 That no parole or probation be granted without suitable psychiatric examination

5 That in considering applications for pardons and commutation, careful attention be given to reports of qualified experts

A sixth recommendation might be included in this program that there be chosen a panel of qualified medical opinion, if possible from university and major hospital staffs, who would advise the conscience of the court. These physicians would receive adequate remuneration from no private individual or corporation but from the state, and from the state only.

The third provision, that no maximum term be set to any sentence of imprisonment or segregation—call it what you will—is of the highest importance. We cannot pick out of the community morons, slightly feeble-minded persons, constitutional inferiors, mildly psychopathic and paranoid individuals and arbitrarily incarcerate them. Magna Charta, Habeas Corpus and the rest of our individual liberties have seen to that. But when such incurable people have proved dangerous by crime, by antisocial actions, then we, as a society, have a right to demand their segregation probably permanently, or greatly prolonged depending on the nature of their eccentricities and their crimes.

As a community we are too jealous of the life of the killer and not thoughtful enough of the life that has been ended. We are sentimental about life and a woolly-minded intelligentsia tries to make us believe that by uplift, moral suasion, movies, gardens, concerts and the latest shows from Broadway we soften thugs and make silk purses out of sows' ears. But Christ said "By their fruits ye shall know them" and "Does a fig tree bring forth thistles?" and in this scornful question spoke as an aristocrat of intellect and biologic truth.

May I repeat my belief that it must come to pass that doctors of seniority will be chosen for part time work in the courts payable by salary from the state, having such experience and prestige that a magistrate of no psychiatric experience would ever think of giving an opinion on a matter of medicine contrary to their opinion; there can be found men of learning and of wisdom, men impartially selected and working impartially for the state.

#### FALSE SENSE OF KNOWING

It is a peculiar fact that everybody has an opinion about medicine and things medical. We would not dream, nor would the lawyer dream, nor would the judge dream, of building a bridge, of telling the expert engineer how he should build the bridge, or if the materials out of which the bridge was being built were adequate and likely to reach the conclusion and objective desired. That would seem on the face of it an absurdity, but it does not seem on the face of it to be absurd that opinions should be given on matters of greater and larger difficulty than the appraisal of the modulus of elasticity of a metal. The appraisal of the modulus of elasticity of a man is surely the most difficult enterprise to which the human mind can be bent, and it requires not only great experience but

great technical experience to be able to reach here a conclusion even moderately successful. This arbitrament is by law, our common law, left in the hands of twelve laymen, chosen almost at random in the population, the lawyers reared with the sense of the omnipotence and omniscience of twelve good men and true must themselves feel that they also are knowledgeable and strong in these matters, so that they take occasion to instruct the simple persons who for thirty years have been dealing with abnormal behavior.

It might be thought that, with society trying to adapt itself biologically to quite new conditions, new conditions for the animal man, new speeds for the same five senses we have always had—and we have an immense impact of stimuli into those five senses owing to their great prolongation, sense by sense—that we would occasionally break and totter in our adaptation. The fact of the enormous number of persons with nervous and mental disease in the hospitals of the country would seem to verify such expectation. It would also seem that we should recognize more quickly than formerly the disordered mind, but this does not always happen, for the intellectually alert person with a serious chip on his shoulder, recognizable by men of experience as a paranoic type, is often a professional litigant. The paranoiac feels a sense of umbrage at persons in particular and society in general, and he is a persuasive fellow, and a turbulent fellow, and he wears his lawyers out, but he impresses his lawyers often by reason of the strength of his own conviction. He carries conviction to them regarding the various abominations that have been put on him. After all, if a man is sincere in what he says he will always make disciples. If he truly believes that the moon is made of cream cheese and asserts it in declamation in front of this building—if he believes it hard enough—he would be a person of very small personality indeed not to get three disciples before dark. Sincerity, conviction of absolute inner truth, is the thing that molds and influences men—and the paranoiac is the most sincere person in Christendom. Sincerity alone is not virtue, the most sincere people on earth are in Manhattan State Hospital! The sincere individual under a delusional urge can succeed in persuading lawyers and judges of his rectitude, his innocence, his martyred state and often can make those officials believe he is sterling when the doctor in rather tentative fashion is saying the opposite and getting nowhere at all. Consequently the paranoiac, under instruction, is often a successful litigant and is discharged from courts and hospitals prematurely. Regard the outcrop of homicides by patients with a mental history. We are justifiably concerned with the menace to society arising from a legal system which often supports paranoiac litigants and sets free paranoiac criminals who, under provocative circumstances, lack self control.

Only the other day, it will be remembered, a Russian gentleman who came to this country to earn his living was a "diener" in the Columbia Dental School. He had a brooding ill will against mankind and at last gave tongue to that ill will by killing three of the professors in the laboratory and then shooting himself.

The public, not entirely for its own good, including those at the bar and bench, has a verbal acquaintance with "fixations" and "conflicts" and "complexes" and all the new words that have been recently invented to describe old things. Their nodding acquaintance with these Viennese neologisms gives them a false sense of knowing, it is important that our two professions

should work hand in hand and in step in dealing with these matters. It is particularly important for the layman, however high he may be in the law, to realize that we cannot tell him how to administer the law but that we, having freed ourselves from the possible implications of financial direction, by becoming impartial individuals, must not be told on the other hand by untrained persons how to mold our perceptions and administer our sustenance to the mind diseased.

I have some legal cases illustrative of what I have in mind. I spoke a moment ago of the irresistible impulse, which as recognized by law has given rise to a tremendous controversy and confusion and has given rise to the very improper classification, if it can be so called, of moral insanity. That a person was suffering from a state in which the intellectual faculties are sound, and the moral faculties diseased, or that he was under the influence of a mere "uncontrollable impulse of the mind" coexisting with the full possession of the reasoning faculties is in England no defense. How the law is construed is evident in such a case as this. In *Re v Quarumby* the defendant was tried for murder of a woman with whom he had been living in adultery. Facts presented proved that he had shown deliberation and premeditation. He had expressed satisfaction that he had killed the woman and regret that he had not killed her mother at the same time. He was just one of those frank fellows! The defense raised at the trial was that the crime was committed in a moment of impulsive insanity and that the prisoner was insane within the definition of English law at the time of the act. The counsel argued that the subconscious mind of a person afflicted with delusions was a factor which should be considered in connection with acts committed by one whose unrestrained passions resulted in crime. The contention of insanity was based on grounds never yet admitted to any English court of justice. The judge pointed out that if the question of uncontrollable impulse had to be considered there was no evidence that the prisoner was laboring under such. The defendant was convicted of murder and sentenced to death. The grounds of appeal were misdirection and that the verdict was against the weight of evidence. The appeal was dismissed.

In the case of *Re v Harding (Crown v Harding)* the prisoner was tried for murder on an indictment and at the same time on a coroner's inquisition. The coroner's jury had returned a verdict of wilful murder but added a rider that they all agreed that she was not responsible for what she did. At the trial the judge refused to admit this as evidence and the jury found the prisoner guilty but added a rider to their verdict that at the time she committed the act she was in a "frenzied state of mind." It was held that this did not amount to a verdict of insanity. The defense appealed because of the exclusion of the rider as evidence. The court of appeal upheld the decision.

#### COMPETENCE TO JUDGE MENTAL STATES

While the law prescribes the manifestations of mental disorder which exempt an offender from criminal responsibility, it is for the jury to decide on the facts as to his condition at the time of the act. If circumstances to them seem to warrant it, they may ignore the evidence of medical witnesses. The most meticulous and accurate medical history recording what appears as evidence of mental disease to the psychiatrist may have no weight whatever with the body of laymen. They can be informed and advised but they alone make the decision. A jury of laymen is not competent to pass

on the question of whether or not the accused's history would indicate liability to periods of complete mental confusion. It cannot be expected to discern the finer shades and borderlines dividing mental health and mental disease—a shadow land even to trained observers.

In trying to use what knowledge it has, psychiatry is handicapped by the existing criminal code and cannot work properly through it and because of it. Even when facilities for examination and study of the defendant by qualified experts are provided, the final say as to disposition is not in their hands. Take, for instance, the paranoiac who so easily may become the victim of misapprehension. The seriousness of such a situation becomes obvious with the realization that it is part of the paranoid character to tend to express itself in antisocial acts. Paranoiacs are often potential homicides. The criminal act which is prompted by, or is the outcome of, delusion is often of a character which does not logically flow from the delusion, for the deluded person is so affected in his judgment that he is unable to deduce logical consequences from it. But today, aside from the prevention of harm either to himself or to others, medical science aims to benefit the individual under institutional supervision. In recognizing paranoid trends we hope to be able to modify, if not cure, the neurotic character and prevent the development of complete paranoia. The importance of tracing such trends should be stressed, for, as has been stated, they are often concealed behind the appearance of quick mental health. This has a bearing on the paranoiac as a successful litigant. Appreciation of potentially dangerous behavior, no less detection of it, cannot be expected of laymen, nor of judges or lawyers untrained in niceties of mental aberration, often baffling to psychiatrists of experience.

According to statutory procedure in two thirds of the states, the question of recovery and right to release a person committed to an institution on criminal proceedings is determined by one of the following agencies: the superintendent of the institution of confinement, some administrative board, the court, or by the concurrence of two of these agencies. In a few states release can be effected only by a special act of the legislature or by warrant of the governor. In Kentucky and Washington a trial by jury is a prescribed part of the procedure for deciding the question of recovery. In the latter, twelve laymen are given the responsibility not only of appraising the mental health of the person under consideration but also of deciding whether he is liable to a recurrence of relapse and is safe to be at large—often difficult even for medical men. In various states we find power of parole or discharge lodged in a state board of corrections or a state board of control, a commission of lunacy or the justice of a superior court. Investigations are made by commissioners who need not be alienists or otherwise qualified to judge mental conditions, except that one of them must be a physician. However, in Massachusetts any person may apply to the local district court justice for the parole or discharge of a defective delinquent yet in this same state there is legal provision (Briggs law) for persons indicted or bound over for trial in a superior court, who have a history of previous conviction for felony or of more than one indictment, to be examined by the Department of Mental Disease to determine the presence of any mental disease or defect which would affect his criminal responsibility. The report is to inform the court and counsel. Incidentally, this law has been



amended four times since its enactment in 1923. Such a provision prevents the psychotic or otherwise mentally incompetent from going unrecognized and, in addition, is economical and efficient, the expense of trials being costly for the state.

The proportion of prisoners found insane on arraignment has been greater in recent than in former years. Dr. William Orange, late medical superintendent of Broadmoor Criminal Lunatic Asylum in England, stated, "it is not odd that the number in whom insanity is established on arraignment is not large when obviously an accused person may be sane as far as his ability and fitness to plead are concerned." From the time the Broadmoor Asylum was opened in 1863 to the end of 1888, 30 per cent of those arraigned in court and found insane had been found so on arraignment, from 1918 to 1932, 48 per cent. Whether the person charged with crime is sane enough to undergo trial is of the highest importance. From the point of view of humaneness, mentally unsound defendants should be sorted out before trial and not put through that ordeal. The almost universal lack of proper expert examination of accused persons before trial results in conviction of persons actually insane, who soon are transferred from prison to hospitals for the insane.

It is not surprising with this variety of ordinances that so many insane are free to become a social menace. What happened in the case of Dukor is probably of more common occurrence than is realized. In 1929, when 18, Dukor was an inmate of the Maryland School for Boys. While there he was examined by the psychiatrist of the school and found to be a psychopath of the chronic delinquent type. This condition is not recognized by the law of Maryland as insanity, and there is no place of detention for permanent segregation of seriously defective delinquents. Dukor escaped from the school and later in New York served eighteen months in the Elmira Reformatory for the commission of a crime. There he was again examined, he was the subject of study by the psychiatrist of the institution, and the diagnosis of psychopathic personality was made. His condition does not amount to insanity under the law of New York. In January 1931 in Baltimore he committed murder in the course of banditry. Seven expert witnesses were heard in the case, besides the written reports rendered. He was capable of appreciating the consequences of his act, but he was held socially dangerous and a menace to the life of others whether he was at large or confined to prison. The court sentenced Dukor to death, probably rightly with regard to his last crime. However, Judge Ulman at the time stated that this was a confession of social and legal failure. Such may or may not be a fair indictment. That he was diagnosed at 18 as a defective individual and a chronic delinquent ought to have made it impossible for him to be again in the world at large, and then it would have been unnecessary to kill him after he had killed somebody else. Such a man as Dukor can often be placed in an institution and made almost self supporting. These underendowed persons are often capable when put into a frame where life is not full of necessary decisions, which they are incapable of making. Such an individual is often not really the expense of the state that it would appear. He can be made able to work in a controlled environment.

It becomes apparent that lack of concentration of authority and responsibility existing in many jurisdictions is an important factor in accounting for the num-

ber of potentially dangerous individuals at large. Further, the qualifications and fitness of those given the power to judge the mental state of persons seeking release seem to be totally disregarded. Discharge is not governed by scientific principles. Whatever the weakness accountable here for the present situation, the same serious condition is not found in England.

If insanity, according to English law, is proved in the case of a person charged with crime, a jury cannot now, as formerly, acquit the accused, but it may bring in a special verdict that he was guilty of the act charged but was insane at the time when the act was committed. The result of this special verdict is that the court orders the accused to be kept in custody as a criminal lunatic "until the king's pleasure is known"—that means life. It is the Secretary of State only (that is to say the Secretary for Home Affairs, the highest officer in the land)—and he alone—who is permitted absolutely or conditionally, as he sees fit, to direct transfer, revoke the discharge or remand the criminal lunatic. He receives expert reports on his condition, reviews and takes into consideration further disposition of the case and in his judgment may even remit the criminal lunatic to prison to be dealt with according to law.

There must be revision in the tests for criminal insanity, and changes must be made in the machinery by which the criminal insane are tried, discharged and released. Of the recommendations made by commissions and medical, legal and criminological authorities—and there have been many over a period of years—a certain number are of high importance if the ill effects of this part of the present system are to be checked.

The suggestion has been made that mental unsoundness be tried as a separate issue, thus making an end of fact muddling. The court should appoint expert witnesses whose competence to judge mental states is in some manner guaranteed. They shall assist the judge and jury in the difficult task of determining the defendant's mental condition. Suitable psychiatric examination should precede parole or discharge in every case, so that the mentally unsound defendant shall not escape recognition and the responsible criminal, mentally and emotionally aware, shall not escape justice. Doing this work are some psychiatric clinics and laboratories connected with courts in some cities, but comparatively few. It is necessary that expert medical reports be given careful attention in considering applications for parole, pardon and commutation.

These recommendations all aim at giving the judge and jury the benefit of sound unprejudiced expert opinion to assist them in passing on the question of the defendant's sanity or insanity. But even with the most exact and reliable information available and the wisest counsel, as well as the avoidance of conflicting evidence of alienists, the jury is really not competent to make the decision. To find the fact of guilt or innocence, and no more, should be the function of the court. Disposition and treatment based on a scientific study may be recommended by qualified and impartial experts, and yet the jury fail to appreciate their significance. The haphazard method of leaving facts whose nature and social effects can be comprehended only by specifically trained minds to the judgment of laymen selected at random must be abandoned. The final decision on facts should be submitted to medical experts, psychiatrists and penologists. The physician should say what shall be done with the mentally unsound defendant.



In speaking before the New York Academy of Medicine in 1928, of the transformed legal structure he foresaw in the future, Mr Justice Cardozo (now of the Supreme Court of the United States) said "The physician may be merely the ally of the judge in the business of admeasuring the sentence or, as to that branch of the work, may even drive the judge away"

410 East Fifty-Seventh Street

WAVELENGTH IN THE HEATING OF  
HUMAN TISSUES BY SHORT  
WAVE DIATHERMY

JOHN S COULTER, MD, DTM  
AND  
STAFFORD L OSBORNE, BPE

Associate Professor of Physical Therapy and Associate Department of  
Physical Therapy Respectively Northwestern University  
Medical School  
CHICAGO

Short wave diathermy has introduced problems that are similar to those which confronted us when so-called conventional diathermy was first used With conventional diathermy it was a slow tedious process to eliminate the many unwarranted claims As a result of many investigations, the therapeutic possibilities as well as the therapeutic limitations became better understood Many illusions were dispelled, but this field of therapy was placed on a more solid foundation

A new impetus has been given to diathermy as a therapeutic agent since the introduction of short wave diathermy generators, and again the worker in this field is confronted with many confusing claims He is told that short wave diathermy has specific biologic effects independent of the heat generated by the current, that it has specific bactericidal effects and that it has special selective thermal action, as well as a greater and more uniform generation of heat into the tissues

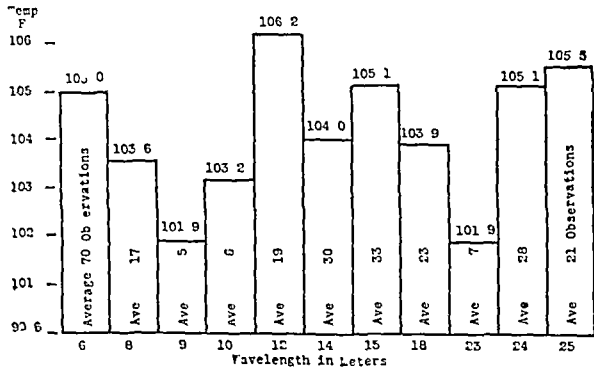


Chart 1—Relation of wavelength to temperature in the 279 observations various techniques were used with the electromagnetic and the electric field

Most of these assumptions thus far have not been substantiated by conclusive or critical experiments, neither have other workers been able to duplicate them We have discussed this matter in previous communications

This report will be confined especially to a discussion of the so-called selective thermal action of short wave

diathermy Schliephake<sup>2</sup> stated that there is an optimal wavelength for different tissues From this may be inferred (1) that by a suitable choice of wavelength the heating of a particular tissue may be favored over that of contiguous tissues and (2) that by the selection of the specific wavelength the degree of heat generated in the deeper parts of the body will be greater than that generated directly beneath the electrodes In other words, the thermal gradient is reversed

Hosmer,<sup>3</sup> McLennan and Burton<sup>4</sup> and later Pätzold<sup>5</sup> and Reiter<sup>6</sup> showed from a mathematical and physical study of the heating of electrolytes in the high frequency fields that the heating depends on the specific conductivity of the liquid They showed that there is a maximum rise of temperature for a given conductivity This maximum is more marked the higher the frequency The conductivity at which the maximum heating occurs is shown to be proportional to the frequency The distribution of the electric field in the interior of a heterogeneous body is determined largely by the dielectric constant and the specific conductivities For a given wavelength there is apparently a

Effective Wavelengths According to Various Authors

Author	Fat	Minimum Heating
	Maximum Heating	
Schliephake	14.5 meters	7 meters
Gebbert	3 meters to 16 meters	No differences
Bachem	5 meters	Not given
Muscle Tissue		
Schereschewsky	4.69 meters	1 meter
Holzer and Weissenberg	20 meters	10 meters
Gebbert	No differences using 3 to 16 meters	

maximum heating effect produced in a medium, and this may be expressed by the relation  $2C = NK$ , where C is the specific conductivity in absolute units, K the dielectric constant and N the frequency In other words, twice the specific conductivity is equal to the product of the dielectric constant and the frequency

Extending this mathematical and physical relationship to the body, McLennan and Burton<sup>4</sup> suggested that a selective heating effect is possible from a knowledge of the characteristic electrical constants of the substances of the body Schereschewsky<sup>7</sup> investigated the dielectric constant of various body tissues and found no great difference in the many tissues under study However, with marked differences in tissue conductivity this mathematical and physical conception makes it still appear a possibility that selective heating might be obtained

Evidence has been presented by many workers that wavelength probably does play a part in the selective heating of nonliving tissues But even in this regard the evidence is chaotic and difficult of interpretation No two workers seem to agree as to the effective wavelength for the various nonliving body tissues The accompanying table is offered as an illustration

The inconsistent results of the various authors, of which those cited in the table are typical gives a most confusing picture Such evidence would hardly qualify as conclusive

Aided by a grant from the Council on Physical Therapy of the American Medical Association

1 Mortimer Bernard and Osborne S L Short Wave Diathermy Some Biologic Observations J A M A 104 1413 1419 (April 20) 1935

<sup>2</sup> Schliephake Erwin Kurzwellentherapie Jena Gustav Fischer 1932  
<sup>3</sup> Hosmer Helen Heating Effects Observed in a High Frequency Static Field Science 68 325 (Oct 5) 1928  
<sup>4</sup> McLennan J C and Burton A C Canad J Research 3 224 (Sept) 1930  
<sup>5</sup> Pätzold Johannes Strahlentherapie 15 645 (Dec 7) 1932  
<sup>6</sup> Reiter T Brit J Phys Med 8 119 (Dec) 1933  
<sup>7</sup> Schereschewsky J W Radiology 20 246 (April) 1933

Under living conditions it would seem reasonable to suppose that conductivity of tissues might change with changing temperature. Mortimer<sup>8</sup> has shown that when the living animal is subjected to the short wave electric field the temperature of the various organs equalizes owing to the rapid transfer of heat by convection due to the circulating blood. This transfer of

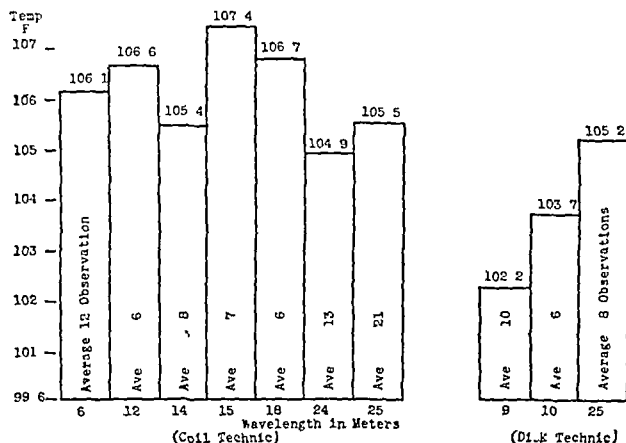


Chart 2—Relation of wavelength to temperature in the electromagnetic field. The coil technic was used in seventy three observations and the disk technic in twenty four.

heat is one of nature's most elemental protecting mechanisms for internal adjustment to external or internal thermal influences. Mortimer found that after death the organs of animals will heat at different rates. We feel therefore that, before the theory of an optimal wavelength for heating various tissues can be accepted, experiments must be made on the living animal which can be duplicated by other workers.

For some time we have been conducting in vivo experiments of tissue heating. Some preliminary reports<sup>9</sup> have been made. We submit in this paper our results of 279 experiments. These experiments were carried out on adult male medical students averaging in weight 170 pounds (77 Kg). Our procedure was to intro-

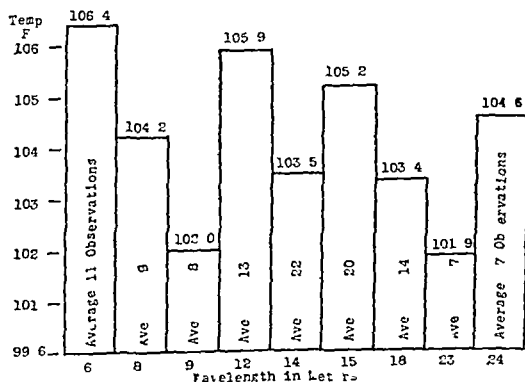


Chart 3—Relation of wavelength to temperature in 111 observations in which the electric field was used with the cuff technic.

duce a hard rubber cannula with a trocar into the midpoint of the thigh through the quadriceps muscles for a depth of 2 inches (5 cm) or until the femur was encountered. The diameter of the cannula was

just large enough to introduce a 16 gage hypodermic needle. The trocar was removed and replaced at will by a thermocouple made of constantan and copper wires (28 gage Leeds and Northrup double cotton covered and enameled) soldered into the tip of a 16 gage lumbar puncture hypodermic needle. The thermocouple was connected to a potentiometer (Leeds and Northrup portable precision type No 8662). The couple was calibrated against a Bureau of Standards calibrated thermometer with scale divisions in 0.1 degree Fahrenheit. Calibration tests indicated that the potentiometer and thermocouple combination had an error of  $\pm 0.2$  degree F. The thermocouple was removed from the field during the passage of the high frequency current. To conform to general clinical practice, the current was applied for twenty minutes. Temperature readings were made at the beginning and the termination of the treatment.

For these tests we used every type of machine in operation today. The technical application was made by expert technicians and supervised by an engineer from the factory of the particular machine that was used. The machines therefore were operated under the most favorable conditions. The technics used were those advocated by the manufacturers and conformed to clinical practice.

Our applications were made as follows: The high frequency electric field with (a) pad electrodes, (b) air gap electrodes of various types and (c) double cuff electrodes, the electromagnetic field with (a) coil technic and (b) flat pancake coils or disks.

We employed the following wavelengths: 6, 8, 9, 12, 14, 15, 18, 23, 24 and 25 meters. Pad electrodes were applied laterally on each side of the thigh with the cannula centered between them. This is generally known as the "through and through" technic. There was a great deal of variation in the materials of the so-called air gap electrodes. Some were of bare metal enclosed in glass containers, others were of metal encased in rubber with air as the dielectric between skin and electrodes, while others used sponge rubber solely for the dielectric. Many variations in application of the electrodes were made.

After much experimentation it was possible to get effective heating with air-spaced electrodes provided the following technic was used. The electrodes were applied to the anterior surface of the thigh equidistant from the cannula and in the same plane. The distance used from center to center ranged from 7 to 11 inches (18 to 28 cm). Whenever other technics were employed less effective heating resulted. Our final average temperature is low with this technic. The measurements secured with poor technic, such as incorrect air spacing, were averaged in with the results obtained with a more perfect technic. All these variations in technic were used because they were, and still are, used by the clinician in this field. Technics such as the so-called through and through method, or other technics that apply the electrodes in a manner other than that indicated by us as effective, are effective for superficial heating but quite ineffective for deep tissue heating. Double cuff electrodes were applied around the thigh, one proximal and the other distal, equidistant

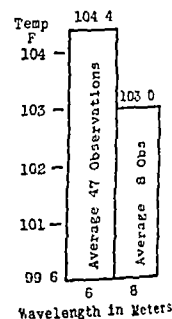


Chart 4—Relation of wavelength to temperature in fifty-five observations in which the electric field was used with the air spaced electrodes.

<sup>8</sup> Mortimer, Bernard. *Radiology* 16: 785 (May) 1931.  
<sup>9</sup> Coulter, J. S. and Osborne, S. L. *Short Wave Diathermy. A Comparative Study in Pelvic Heating.* *Arch. Phys. Therapy* 17: 135-139 (March) 1936.  
 Coulter, J. S. and Carter, H. A. *Heating of Human Tissues by Short Wave Diathermy.* *J. A. M. A.* 106: 2063-2066 (June 13) 1936.  
 Coulter, J. S. and Osborne, S. L. *Short Wave Diathermy in Heating of Human Tissues.* *Arch. Phys. Therapy* 17: 679-687 (Nov) 1936.

from the cannula. There were differences also in the width of the cuffs. Each manufacturer supplied the cuffs he advocated for his particular short wave generator.

In the electromagnetic field there was greater uniformity both as to the cable itself and as to the number of turns employed. Three or four turns of the cable were applied around the thigh with the cannula midway between the extremities of the coil. The disk was a cable in a flat pancake form embedded in a hard rubber container. The cable formed into a pancake coil without the container was also used and was applied so that the cannula was in the center of the innermost turn.

In the charts we have not shown the initial average temperatures for each wavelength, but they averaged 99.6 F, and we have therefore used this combined average as the base line. We have recorded the final average temperatures reached in the deep muscles of the thigh arranged according to wavelength. For each wavelength we have also recorded the final average temperature reached with the various technics employed. Charts 1, 2, 3 and 4 show these comparisons graphically. It would appear from these data that the wavelength is not a factor in selective thermal effect.

The differences in temperature rise by different wavelengths, we believe, are more apparent than real. First, the output of energy from the generators varied markedly, second, one is unable to measure accurately the amount of high frequency energy delivered to the patient, and, third, the method of application makes a marked difference. These three variables we feel could readily account for the apparent differences observed in the charts. We do not offer our work, however, as evidence that there is no optimal wavelength for heating tissues.

Chart 1 is a graphic presentation of our complete data, which include 279 observations arranged regardless of the method used and shows the relationship of temperature to wavelength, employing wavelength as

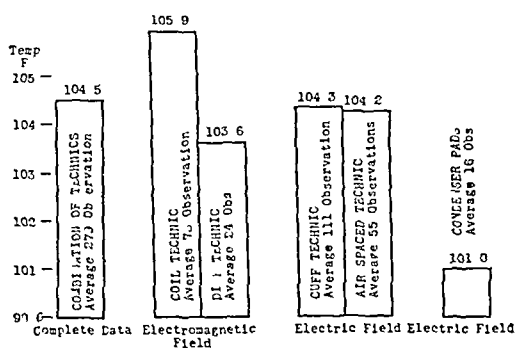


Chart 5—Relation of heating to technic regardless of the wavelength used

the independent variable. Charts 2, 3 and 4 are plotted similarly. Chart 2 shows the results obtained in the electromagnetic field while charts 3 and 4 present the results secured in the electric field. The double cuff method was used in the experiments recorded in chart 3, and air-spaced applications were made in those recorded in chart 4. Chart 5 shows the average rise in temperature in relation to the method of application and without regard to the wavelength employed. From these charts it would appear that wavelength itself is not selective in its ability to generate heat deep in human tissues. On the other hand, we believe the method of application does make considerable differ-

ence. This is shown clearly in chart 5. When we used the coil technic in the inductive field we secured the highest and most consistent temperatures.

#### CONCLUSIONS

1 Two hundred and seventy-nine temperature observations on the human thigh were made, high frequency currents with wavelengths varying from 25 to 6 meters being used.

2 We believe that wavelength per se is not a marked factor in tissue heating in the living subject but that differences in machines, the energy delivered to the patient and technic have important roles.

3 The electromagnetic field produces the most effective heating of live human tissues.

4 The double cuff method of the electric field is an effective technic.

5 Air-spaced electrodes are effective for deep tissue heating provided the anterior surface application is used as outlined.

303 East Chicago Avenue

### Clinical Notes, Suggestions and New Instruments

#### THE EFFECT OF CAMPHOR IN OIL ON LACTATION

R. R. GREENE, M.D. AND A. C. IVY, PH.D., M.D.  
CHICAGO

It is often clinically desirable to prevent postpartum engorgement of the breast and to induce rapid involution of the lactating breast. Claims have been made and evidence presented that intramuscular camphor in oil causes these effects.<sup>1</sup>

One of us has had the opportunity to test the effects of this substance. It was given in the approved manner and dosages (3 grains [0.2 Gm.] intramuscularly once or twice a day for five days) to a few postpartum patients. When the results were compared with those obtained in alternate cases in which no treatment had been given, the value of the camphor was not discernible.

With one exception<sup>2</sup> in the clinical experiments on this subject, no untreated controls were used. Data were not presented as to the qualitative or quantitative engorgement or the amount of lactation in the untreated control female. It is known that some women do not manifest engorgement post partum. This seems to be more frequent after stillbirth and premature deliveries. Camphor in oil was most frequently used in such cases (i.e., with a dead baby). Further, it is difficult to evaluate such a condition as "breast engorgement." The validity of conclusions based on the observation of treated cases only is debatable.

Accordingly it was decided to determine the effects, if any, of camphor in oil on lactation under adequately controlled experimental conditions. To obtain such conditions in a problem of this sort, animals must be used. Rats and guinea pigs were the animals of choice and were kept under identical conditions were fed identical diets and were from our stock, interbred colonies.

The first group of animals consisted of twenty rats. Alternate animals were given 1 grain (0.065 Gm.) of camphor in oil subcutaneously daily for the first five postpartum days. All litters were limited to six siblings and all litters were

From the Department of Physiology and Pharmacology, Northwestern University Medical School and the Gynecological and Obstetrical Service, St. Luke's Hospital.

<sup>1</sup> Roenblatt, J. Action of Camphor on the Lactating Breast. Zentralbl. f. Gynak. **46**: 1523-1524 (Sept. 3) 1922. Philpot, N. W. Intramuscular Injection of Camphor in Treatment of Engorgement of the Breast. Canad. M. A. J. **20**: 494-495 (May) 1929. Leigner, B. Effect of Camphor on Lactating Breast. Zentralbl. f. Gynak. **57**: 244-253 (Feb. 4) 1933. McNeile, L. G. Breast Care with Special Reference to the Use of Camphor in Oil in Suppression of Milk Secretion After Still Births and at Time the Infant Is Weaned. West. J. Surg. **42**: 61-69 (Feb.) 1936. Klein, M. D. Effect of Camphor in Oil on Lactation. Am. J. Obst. & Gynec. **31**: 897-897 (May) 1936.

<sup>2</sup> Klein.<sup>1</sup>

weighed daily for seventeen days. The young rat does not eat until the seventeenth or eighteenth day.<sup>3</sup> The gain or loss of weight of the young, then, is a direct indication of the quality or quantity of milk produced by the mother. This method is generally used to determine the effect of various procedures on lactation.<sup>4</sup>

It should be mentioned that 1 grain of camphor given to a rat is a much larger dose than that given to the human being. It is apparently the largest dose that can be given without

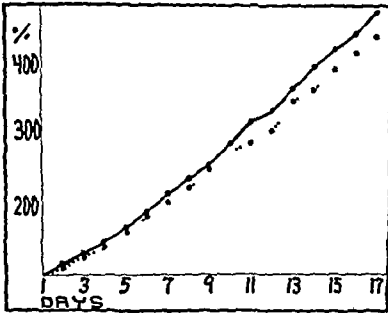


Chart 1—Average percentage of weight increase in young rats. Solid line represents untreated control group, broken line, camphor treated group.

producing evidences of toxicity. Three grains (0.2 Gm) caused convulsions and death in one animal, while 1½ grains (0.1 Gm) caused symptoms of marked toxicity in three animals.

#### RESULTS

Chart 1 shows the average percentage in gain of weight of the young of the ten treated mothers and of the ten untreated control mothers. It is

to be noted that the camphor produced no significant difference in the percentage increase in weight over the birth weight. The total infant mortality of the sixty siblings of the "camphor group" was four, which was identical with that of the untreated control group.

The second group of animals consisted of twenty-seven guinea pigs. Alternate animals were injected with 1½ grains of camphor in oil on each of the first five postpartum days, and the siblings were weighed daily. This dose was also apparently close to the toxic dose for the guinea pig, as one animal developed convulsions and died on the third day of treatment. One untreated animal died on the eighth postpartum day and one treated with camphor died on the tenth day of unknown causes. One of the treated and one of the untreated animals apparently did not lactate, and their young died on the second postpartum day. No breast engorgement was found in these animals and no milk could be expressed.

Chart 2 represents the average percentage in gain in weight of the offspring of eleven treated and eleven untreated guinea pigs.

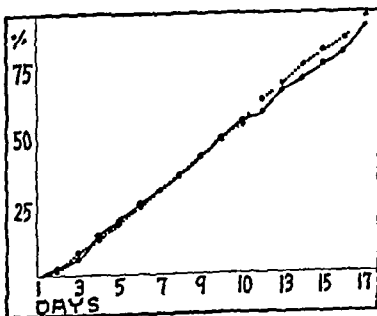


Chart 2—Average percentage of weight increase in young guinea pigs. Solid line represents untreated control group, broken line, camphor treated group.

No significant difference in the gain in weight of the nursing guinea pig can be noted whether camphor is or is not given to the mother.

From results obtained in groups 1 and 2 it is concluded that camphor has no effect on lactation in the suckled rat or guinea pig. However, to observe the effect of camphor on the functional breast that was not being stimulated

were made on each animal (under ether anesthesia) on the first, third, fifth and seventh postpartum days. The criteria used were the presence and amount of alveolar components, the presence of secretion in the lumen of the alveoli and ducts, and the relative amounts of glandular and stromal elements. Individual variations were observed. One treated and one untreated animal showed little evidence of function on the first day and involution was more rapid in these two. A small amount of nonsecreting alveolar tissue could be found in all the animals on the seventh day. No difference in the rate or amount of involution could be noted between the treated and the untreated control animals. The camphor did not produce any observable effect on the involution of the mammary gland.

#### SUMMARY

The pharmacologic action of camphor on lactating and involuting breast tissue has been studied in the rat and the guinea pig. No particular rationale for the use of this substance to inhibit lactation or engorgement of the breast was observed nor has any been presented in the literature. It is apparent from our results that camphor in oil does not inhibit lactation or hasten the process of involution in the rat or the guinea pig. Until more adequately controlled and more objectively measured experiments on the human being are presented, the advisability of the use of such a substance is open to question.

303 East Chicago Avenue

#### THE REMOVAL OF AN ACCIDENTAL VACCINATION SCAR BY BLISTERING DOSES OF ULTRA VIOLET RAYS

A. A. FISHER, M.D., WOODSIDE L. I. N. Y.

Accidental vaccinia is relatively common. As pointed out by Ellis,<sup>1</sup> the importance and danger of the fortuitous eruption depends primarily on the site. If, as in my case, it occurs on the face, it may be quite disfiguring. It may even be more serious and occur on the cornea, causing blindness. The

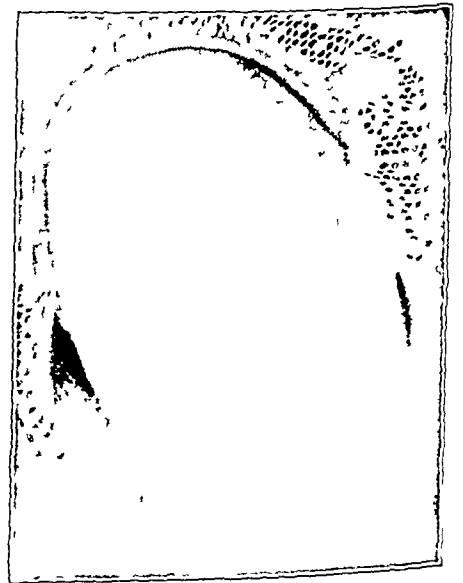


Fig. 1—Control lesion on arm which was identical with scar on face.

vaccine virus may even be disseminated through the blood stream and cause a generalized vaccinia with fatal results. The method of transmission of accidental vaccinia is beyond the scope of this paper.

From the Queens General Hospital, Department of Dermatology.  
Dr. Rudolph Boenke, director.  
1. Ellis, F. A. Eczema Vaccinatum. Its Relation to Generalized Vaccinia. J. A. M. A. 101: 1891 (May 25) 1935.

3. Daggs, R. G. Technique for Study of Lactation in Rats. J. Nutrition 9: 575-580 (May) 1935.  
4. Hain, A. M. Effect upon Lactation of Oophorectomy During Pregnancy in the Rat. Quart. J. Exper. Physiol. 24: 117-125 (July) 1934.  
Enzmann, E. U. The Milk Production Curve of Albino Mice. Anat. Rec. 56: 345-358 (July) 1935. Daggs.<sup>2</sup>

The following case is of interest because of the excellent cosmetic result obtained in the treatment of a scar on the chin resulting from accidental vaccinia.

Joan L., aged 4 years, was vaccinated on the upper part of the left arm Sept 15, 1936, at a board of health station. Five days later the mother noticed a vesicle on the left side of the chin 2.5 cm below the vermillion border, which appeared coincidental with the vesicle on the vaccinated arm. The vesicles on the chin and arm went through the usual stages and resulted in depressed, pitted, violaceous scars. The scar on the arm measured 1.5 cm, that on the chin, 1.25 cm. Several competent dermatologists with whom I discussed this case gave a poor prognosis for a good cosmetic result with any kind of treatment.

It was decided to try blistering exposures of ultraviolet radiation. Andrews<sup>2</sup> has used this method in scars from acne vulgaris and has also used it with success in a few cases of scarring in chickenpox.

One and one-half months after the original vaccination the scar on the chin was given a blistering dose of ultraviolet energy, the rest of the body being carefully shielded. An

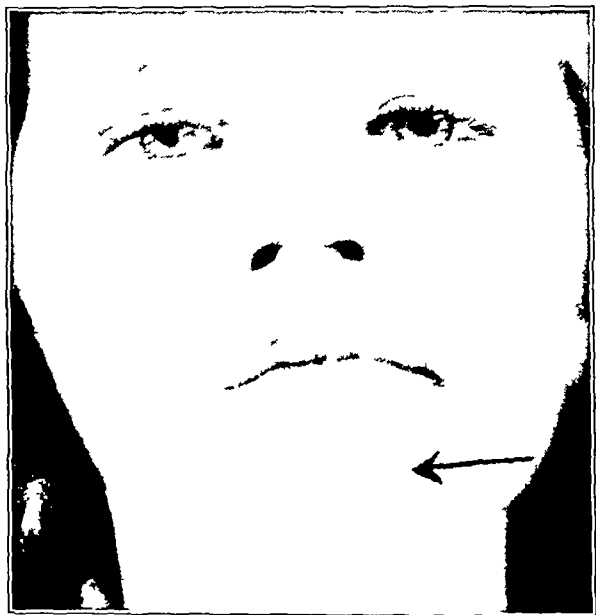


Fig 2—End result on face: a faint depigmented area below lower vermillion border indicated by arrow.

air-cooled mercury quartz lamp was used. The patient received three such treatments at intervals of two weeks. The rationale of this treatment, as pointed out by Andrews, depends on "a local hyperemia which seems to fill in the depressed area and works in combination with the epidermal exfoliation which peels off the scars."

The result in this case was particularly gratifying. Seven months after the treatment the scar on the chin is imperceptible. On close inspection there is a very faint depigmented area where the original scar was present.

The untreated scar on the arm serves as an excellent control. Whereas the scar on the arm is still violaceous, depressed and pitted, the corresponding area on the chin is white, perfectly level with the normal skin and smooth.

At the invitation of Dr. Rudolph Boenke, director of dermatology of the Queens General Hospital, who saw the patient before the treatment, this case was presented at a monthly dermatologic conference.

#### CONCLUSION

A recent accidental scar in a child may be completely removed by adequate blistering doses of ultraviolet rays.

45-14 Forty-Eighth Street

2. Andrews, C. A. *Diseases of the Skin*. Philadelphia: W. B. Saunders Company, 1932, p. 497.

#### BLOODY TEARS: BILATERAL CAPILLARY HEMANGIOMAS

T. J. DIMITRY, M.D., NEW ORLEANS

This case is reported because a tumor of the right orbit and one of the left orbit were symmetrical in design and identical in location and the tissue was of the same microscopic appearance. Furthermore, the patient would often shed "bloody tears," a rare irregularity, increasing the interest in the case.



Fig 1—Front view showing tumors of the right and of the left orbit. They were located just under the roof of each orbit. The tumors were symmetrically placed and of the same size.

Lizzie B., a Negress, aged 51, came to the clinic complaining of a lump that existed over each eye. The lids did not open fully. Vision was 20/40 in each eye and the fundi were normal.

Palpation gave the impression that the masses were dense and of fatty or of fibrous tissue. Though moderately movable,



Fig 2—Side view showing the tumor of the right eye and the extent of protrusion.

they were thought to be attached to the bony orbital roof. The patient became quite annoyed when pressure was made on the growth and would repel the examiner if he persisted. The patient stated that weakness was produced when it was pressed on. In consequence roentgenograms were made, but with negative reading as to eroded bones and the like.

From the Department of Ophthalmology, Louisiana State University Medical Center.

An attempt was made to remove the tumor from the left orbit. The operation, though just begun, was discontinued since hemorrhage of the nose and ecchymosis of the eyebrows were brought about. Subsequently the growth was removed without any of these effects. It was enucleated from its bed under the roof of the orbit. An incision having first been made along the eyebrow, the tumor was readily shelled from the tissue. It extended behind the eyeball.

Bleeding was comparatively slight and though the apex of the growth was not removed the outcome was considered quite



Fig 3—Tumor which was removed from under the roof of the left orbit. It was smooth and shiny as if of fat.

satisfactory. The macroscopic appearance of the enucleated mass was of the form of the roof of the orbit. The eye globe had made an impression into the lower surface. When the removed mass was rubbed with gauze, the surface became quite shiny. At the time it was not looked on as a capsule but as a fatty growth. It had a yellowish hue.

Microscopically the growth was seen to be a hemangioma of the capillary type. Thin walled capillaries predominated and the whole mass was contained in a fibrous capsule.

Hemangiomas of the orbit, particularly those of the capillary type, are not of common occurrence. They are generally unilateral and are found in the young. They may remain latent for years and then become manifest under various causes. Whatever the etiology it does not differ from the causes that produce angiomas of the lips and mouth.

The capillary angiomas do not pulsate nor do they give rise to the bruit. They do cause hemorrhage at times and give rise to 'bloody tears'.

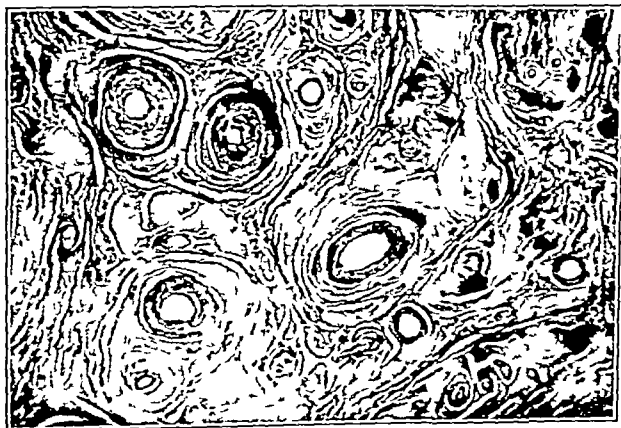


Fig 4—Section of tumor mass removed from left orbit showing the capillary nature of the growth.

The patient under certain conditions would bleed from the nose and at the same time the tears became streaked with blood. Just how the blood reached the conjunctival sac is not known. The patient was seen but once in a hemorrhagic attack and at the time the blood was thought to have reached the conjunctival sac by regurgitation through the lacrimal canal.

This is probably a case of bilateral capillary angiomas. St Charles at Napoleon Avenue.

## WATER INTOXICATION

MORIBUND PATIENT CURED BY ADMINISTRATION OF  
HYPERTONIC SALT SOLUTION

FERDINAND C HELWIG M.D. C BRIANT SCHUTZ M.D.,  
AND HAROLD P KUHN M.D. KANSAS CITY, MO

Dangers incident to forcing fluids have frequently been described in the literature, and fatal complications have been recorded. In 1936 we<sup>1</sup> described the first case of fatal water intoxication resulting from the administration of large quantities of tap water by proctolysis. We were able to reproduce in animals the clinical and pathologic picture that we found in our patient as well as the chemical alterations in the tissues by administering tap water into the rectums of rabbits. In the same communication the mechanism by which water intoxication is produced was discussed and a method by which it might be relieved was presented. In our first case we did not recognize the condition clinically, and it was proved to be an instance of water intoxication only after the postmortem examination. We have recently observed a second case of this condition which we recognized before it resulted fatally. Through proper therapy the life of an obviously moribund patient was saved by the administration of hypertonic salt solution. Because no similar case has, to our knowledge, been studied and recorded, we report the following observations.

### HISTORY OF CASE

A married woman, aged 64, entered the hospital because of vaginal hemorrhage and fatigue. The bleeding started subsequent to a fall a week previously. It lasted two days and then stopped. The menopause had occurred sixteen years previously. She had had no intercurrent bleeding. For the past few months she had been easily fatigued and she had had considerable lumbar backache. Aside from some indigestion and gas, she had had no other disturbances. She had never had any serious illness or any previous operation. She was quite well nourished. The pupils were equal and reacted to light and in accommodation. Aside from a slight murmur in the aortic area, no chest signs of interest were encountered. There was some tenderness in the left part of the abdomen and a mass was palpable on the right side.

On entry the blood pressure was 144 systolic, 80 diastolic, the pulse was 80 and regular. The laboratory examinations were essentially negative. The chemistry of the blood was not determined on admission. Blood examination revealed 78 per cent hemoglobin, 3,920,000 red blood cells, 5,450 white blood cells and 69 per cent polymorphonuclear leukocytes. The urine was normal except for three or four pus cells in the centrifugated specimen.

The day following admission, the patient was sent to the operating room at 10 21 a.m. When the abdomen was opened a large myoma of the right broad ligament was found which measured 90 by 70 by 90 mm. This tumor showed considerable hyaline transformation on cross section. A panhysterectomy and appendectomy were performed. When the uterus was opened there was a very large polyp filling its lumen, and a striking overgrowth of the endometrium was present. The appendiceal lumen was obliterated. The tubes and ovaries showed nothing abnormal. She left the operating room at 11 02 a.m. with a pulse of 96. A proctolysis of 500 cc of tap water was started at 11 20 a.m. The pulse fell to between 80 and 84.

From this point on there was a steady absorption of tap water, which is illustrated in the accompanying chart. This chart also shows the speed of absorption, amount absorbed, urinary output and main important clinical manifestations during the time of absorption, also the rate of elimination following intravenous injections of hypertonic salt solution.

### COMMENT

The first symptoms that might be attributed to water intoxication appeared about thirty-six hours after the operation when the patient had absorbed approximately 7,000 cc of water. From this point on her symptoms grew steadily worse until she became totally unconscious, convulsive movements developed and

From the Departments of Pathology and Surgery, St. Luke's Hospital, Kansas City, Mo.  
1. Helwig F. C., Schutz C. B. and Curry D. E., Water Intoxication: Report of a Fatal Human Case with Clinical Pathologic and Experimental Studies. J. A. M. A. 103: 1569-1573 (May 27) 1933.

she bit her tongue. She became cyanotic and had Cheyne-Stokes respiration, opisthotonos and a bilateral Babinski sign. From the onset of her symptoms of intoxication until the time of her convulsion she had absorbed an additional 1,250 cc of water by rectum, this amount making a total of 8,250 cc absorbed. The prompt administration of 5 per cent solution of sodium chloride by vein relieved her acute moribund condition. On the basis of the blood chemistry determinations of chlorides of 380 mg per hundred cubic centimeters, it was roughly estimated that she had a deficiency of approximately 100 mg per hundred cubic centimeters. The other chemical changes of the blood, such as sugar, nonprotein nitrogen and creatinine, all showed low normal values. We administered 6 Gm of sodium chloride intravenously in order to return the blood to its normal isotonicity, with the idea of bringing at least 6 liters of the absorbed fluid into physiologic equilibrium.

In this respect it is interesting that after administration of 130 cc of 5 per cent salt solution the blood chlorides rose to 480 mg per hundred cubic centimeters. In twelve hours, however, the chlorides had fallen to 350 mg in spite of the fact that the patient had been passing urine in rather large quantities, having eliminated approximately 2,000 cc since the start of her emergency treatment. This sharp decline in blood chlorides was explained on the theory that tissue fluids had been drawn back into the circulation with a resulting dilution in chlorides.

Another interesting observation was the presence of a moderate acidosis, as evidenced by the presence of acetone in the urine and a lowered carbon dioxide combining power of the blood plasma to 32 volumes per cent. This finding was of special

#### SUBSEQUENT CLINICAL OBSERVATION

The patient, two weeks after her dismissal from the hospital, showed a complete return to normality. Her mental status was regarded by her relatives as being normal. We feel justified in assuming, therefore, that the patient completely recovered from a prolonged and severe water intoxication as a result of the timely and adequate administration of hypertonic salt solution.

Forty-Fourth and Mill Creek Parkway

## Special Article

### THE COMPONENTS OF THE VITAMIN B COMPLEX

E M NELSON, PH D

WASHINGTON, D C

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed*

The purpose of this paper is to provide the reader with a picture of what is usually called the "vitamin B complex" and to explain the nomenclature that has been used to designate individual members of the complex. It is apparent to any one who reads a number of papers on this subject that it is difficult to follow the terminology. Confusion has resulted in the past largely because different terms have been applied to newly discovered factors. In addition, specific terms have been coined before the existence of separate entities has been definitely established. Now, however, through chemical isolation and synthesis, through more extensive biologic researches and through clarification of designations, the veil of confusion is lifting and three of the so-called B vitamins are quite clearly discerned. Brilliant researches have elucidated the molecular structure of vitamin B<sub>1</sub> and riboflavin, and the existence of a dietary factor or factors which will prevent human pellagra need no longer be questioned. These three factors will be discussed in subsequent papers.

The members of the B complex may be designated and described as follows:

Vitamin B<sub>1</sub>, the antiberiberi vitamin that prevents beriberi in man and polyneuritis in animals.

Riboflavin, a compound necessary for growth in chicks and rats and for the prevention of cataract in rats. It is a component of an oxidation-reduction system of living cells.

P-P factor, a nutritional factor effective in the prevention of human pellagra.

Filtrate factor, a factor for the prevention of a nutritional dermatosis in chicks. Concentrates which contain this factor have been shown to be effective in the treatment of human pellagra and blacktongue in dogs.

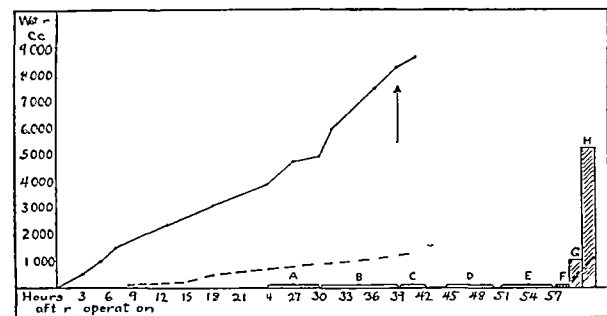
Vitamin B<sub>6</sub>, a factor necessary for rapid gains in weight and normal nutrition of pigeons.

Vitamin B<sub>12</sub>, a factor for the prevention of a specific paralysis in rats and chicks.

Vitamin B<sub>7</sub>, a factor necessary for maintenance of weight in pigeons.

Vitamin B<sub>8</sub>, or vitamin H, a factor for the prevention of a nutritional dermatosis in rats.

Factor W, a factor necessary for growth of rats.



Clinical course in case of water intoxication: solid line tap water; broken line urinary output; dotted line urinary output after intravenous administration of hypertonic saline solution (indicated by arrow). A patient nervous vomiting small amounts of bile stained fluid salivation; B perspiring disoriented; C stuporous irregular purposeless movements passing to convulsions cyanosis; D cyanosis disappeared convulsions decreasing; E convulsions ceased stupor much lighter definite recovery beginning; F emesis; G urinary output; H fluids retained.

interest to us here because previous observers<sup>2</sup> had recorded an alkalosis in experimental animals with water intoxication, while in the present case as well as in our previous one, and also in our experimental animals, there was always an acidosis present. The day after her crisis, when the low chloride estimation was made, sodium chloride was again administered by mouth and the blood chlorides rose to 400 mg per hundred cubic centimeters. Sodium bicarbonate was also given by mouth to combat acidosis. From this point on there was a gradual increase of blood chlorides and an increase in the carbon dioxide combining power of blood plasma, and the clinical manifestations, which were chiefly those of drowsiness and lack of orientation, slowly receded. For a period of four or five days after the acute symptoms, improvement was very slow. During this time the patient had frequent involuntary bowel and urinary evacuations, slept a great deal and when aroused, was quite stupid and often failed to recognize any one. Moreover, she did not seem to be aware of anything going on about her. We were alarmed during this period for fear some irreversible damage might have taken place in her brain as a result of prolonged cerebral swelling. Complete recovery was delayed several days, but when she was dismissed from the hospital she seemed to be in every respect quite normal although she was unable to recall anything that transpired during the period of her severe clinical manifestations or for a period of four or five days thereafter.

<sup>2</sup> Smith F S, Deamer W C and Phatak A M. Studies in So-Called Water Intoxication. J Clin Investigation 12: 55 (Jan) 1933.

From the Food and Drug Administration U S Department of Agriculture



## HISTORICAL DEVELOPMENT

Vitamin B<sub>1</sub> stands unique in that the present vitamin theory was first conceived and developed from studies on the antiberiberi factor and in that the class name was derived from early work on its chemical nature. The story of this vitamin goes back to the epoch making investigations on beriberi by a group of Dutch medical officers working in the Dutch East Indies. Among them were notably Eijkman,<sup>1</sup> who contributed the discovery that the disease could be produced experimentally in fowls, and Grijns,<sup>2</sup> who contributed the rather revolutionary theory that the disease was due to a nutritional deficiency and not to toxicity or infection, thereby laying the foundation for the present conception of vitamins. In 1911 Funk<sup>3</sup> published a series of papers dealing with the isolation from rice polishings of the substance active in the cure of beriberi. The following year this investigator<sup>4</sup> stated "The deficient substances, which are of the nature of organic bases, we will call 'vitamines', and we will speak of a beri-beri or scurvy vitamine, which means a substance preventing the special disease." This name put several nutritional deficiency diseases into a separate class and placed emphasis on them.

Concurrently with studies on beriberi, in attempts to ascertain the nature of all dietary essentials, Hopkins,<sup>5</sup> Osborne and Mendel,<sup>6</sup> and McCollum<sup>7</sup> provided evidence that certain previously unidentified factors were necessary for the growth of rats. McCollum<sup>8</sup> proposed the name "water-soluble B" for one of these factors and presented evidence indicating that water-soluble B and the beriberi vitamin were similar in nature. The terms "beriberi vitamine," "antineuritic vitamine" and "water-soluble B" were used until 1920, when Drummond<sup>9</sup> made the following recommendation, which met with general approval.

The suggestion is now advanced that the final "e" be dropped, so that the resulting word Vitamin is acceptable under the standard scheme of nomenclature adopted by the Chemical Society, which permits a neutral substance of undefined composition to bear a name ending in "in." If this suggestion is adopted, it is recommended that the somewhat cumbersome nomenclature introduced by McCollum (Fat-soluble A, Water-soluble B), be dropped, and that the substances be spoken of as Vitamin A, B, C, etc. This simplified scheme should be quite sufficient until such time as the factors are isolated, and their true nature identified.

While there was not unanimity of opinion with respect to the identity of the water-soluble growth-promoting substance for the rat and the beriberi vitamin prior to 1920,<sup>10</sup> experimental evidence of the existence of a complex of important substances was

developed largely after that date. In 1920 Emmett and Luros<sup>11</sup> reported the first investigation, which clearly indicated that water-soluble B and the antineuritic vitamin were not equally susceptible to destruction by heat and stated that they should be considered different factors. Though a number of other investigators contributed to these studies, several papers from the United States Public Health Service seemed to establish beyond reasonable doubt that vitamin B was not a single chemical entity. Goldberger and Tanner<sup>12</sup> announced that pellagra was due to a dietary deficiency and that among other products which would prevent the disease was brewers' yeast. They proposed the name "pellagra preventive factor" or "P-P factor" for this dietary essential. Smith and Hendrick<sup>13</sup> found that yeast which had been autoclaved to destroy the antineuritic vitamin had a definite supplementing value in a diet for rats in which oats or Seidell's vitamin B picrate was the source of vitamin B. In a paper by Goldberger and his associates<sup>14</sup> on the pellagra preventives in relation to vitamin B, they stated "In any event investigators using the rat-growth test must hereafter recognize and take due account of at least two essentials (B sensu stricto and P-P) where heretofore only one was considered." Goldberger and Lillie<sup>15</sup> produced a pellagra-like syndrome in rats using a ration to which had been added adequate amounts of the antineuritic vitamin. This condition could be prevented or cured by including small quantities of autoclaved yeast in the ration. In commenting on their observations they stated

the possibility remote though it seems is not excluded that there may be in yeast more than one such thermostable factor which further study may succeed in differentiating

As continued evidence of the multiplicity of vitamin B has appeared, confusion in nomenclature and identity of factors has also grown. A few important contributions stand out in this maze which tend to clarify the picture. In 1927 Jansen and Donath<sup>16</sup> announced the isolation of the antiberiberi vitamin. Subsequently the researches of Williams<sup>17</sup> elucidated the structure of the compound, and synthesis was accomplished.<sup>18</sup> In 1933 Kuhn, Gyorgy and Wagner-Jauregg<sup>19</sup> isolated a yellow-green fluorescent compound from egg white which they called "ovoflavin" and which was shown to have growth-promoting properties for the rat.<sup>20</sup> This

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2 Dr Gerrit Grijns. Researches on Vitamins 1900 1911 Gorinchem J Noorduyen en Zoon N V 1935

3 Funk Casimir. On the Chemical Nature of the Substance Which Cures Polyneuritis in Birds Induced by a Diet of Polished Rice. *J Physiol* 43 395 400 (Dec) 1911

4 Funk Casimir. The Etiology of the Deficiency Disease. *J State Med* 20 341 368 (May) 1912

5 Hopkins F G. Feeding Experiments Illustrating the Importance of Accessory Factors in Normal Diets. *J Physiol* 44 425 460 (July) 1912

6 Osborne T B and Mendel L B. The Influence of Butterfat on Growth. *J Biol Chem* 16 423 437 (Nov) 1913

7 McCollum E V and Davis Marguerite. The Necessity of Certain Lipins in the Diet During Growth. *J Biol Chem* 15 167 175 (July) 1913

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9 Drummond J C. The Nomenclature of the So-Called Accessory Food Factors (Vitamins). *Biochem J* 14 660 (Oct) 1920

10 Mitchell H H. On the Identity of the Water Soluble Growth Promoting Vitamin and the Antineuritic Vitamin. *J Biol Chem* 40 399 413 (Dec) 1919

11 Emmett A D and Luros G O. Water Soluble Vitamins I Are the Antineuritic and the Growth Promoting Water Soluble Vitamin the Same? *J Biol Chem* 43 265 286 (Aug) 1920

12 Goldberger Joseph and Tanner W F. A Study of the Pellagra Preventive Action of Dried Beans Casein Dried Milk and Brewers Yeast with a Consideration of the Essential Preventive Factors Involved. *Pub Health Rep* 40 58 80 (Jan) 1925

13 Smith M I and Hendrick E G. Some Nutrition Experiments with Brewers Yeast with Especial Reference to Its Value in Supplementing Certain Deficiencies in Experimental Rations. *Pub Health Rep* 41 201 207 (Feb 5) 1926

14 Goldberger Joseph Wheeler G A Lillie R D and Rosen L M. A Further Study of Butter Fresh Beef and Yeast as Pellagra Preventives with Consideration of the Relation of Factor P-P of Pellagra (and Blacktongue in Dogs) to Vitamin B. *Pub Health Rep* 41 29 311 (Feb 19) 1926

15 Goldberger Joseph and Lillie R D. A Note on an Experiment in Pellagra Like Condition in the Albino Rat. *Pub Health Rep* 41 1029 (May 26) 1926

16 Jansen B C P and Donath W F. Isolation of Antiberiberi Vitamin Mededeel v d dienst volk gezondh in Nederl Indie 10 199 1927

17 Williams R R. Structure of Vitamin B<sub>1</sub>. *J Am Chem Soc* 58 1063 1064 (June) 1936

18 Cline J K Williams R W Ruehle A E and Wagner R E. Studies of Crystalline Vitamin B. XI Identification of the Pyrimidine Portion. *J Am Chem Soc* 59 530 533 (March) 1937

19 Kuhn Richard Gyorgy Paul and Wagner Jauregg. Ueber eine neue Klasse von Naturfarbstoffen (vorläufige Mitteilung). *Ber chem Gesellsch* 66 317 320 (Feb) 1933 Ueber Ovoflavin. *Ber chem Gesellsch* 66 576-580 (April) 1933

20 Gyorgy Paul Kuhn Richard and Wagner Jauregg. The Water Soluble Vitamin B. *Naturwissenschaften* 21 560 561 (July) 1933

compound has also been synthesized<sup>21</sup> Further matters of nomenclature relate primarily to the three factors (antipellagra, antiberiberi and flavin) which have just been described The other factors can be discussed more conveniently if terms are explained first

#### TERMINOLOGY

In 1927 the British Accessory Food Factors Committee<sup>22</sup> approved a system of nomenclature in which vitamin B was used for the complex, vitamin B<sub>1</sub> for the antineuritic vitamin, and vitamin B<sub>2</sub> for the more heat-stable fraction of the complex As evidence for the existence of other factors developed they were designated as vitamin B<sub>3</sub>, vitamin B<sub>4</sub>, vitamin B<sub>5</sub> and vitamin B<sub>6</sub> In 1929 a committee on vitamin B nomenclature for the American Society of Biological Chemists<sup>23</sup> recommended that the term "vitamin B" be used to designate the more heat labile factor or antiberiberi vitamin and "vitamin G" be used to designate the more heat stable fraction of the complex This system of nomenclature has been confined almost exclusively to American literature The term "vitamin G" has been used to some extent since that time to refer to the pellagra-preventive factor, but this terminology has not been used by the United States Public Health Service Terminology that is not in accord with either the British or the American system has also been used When Kuhn demonstrated that his flavin had properties of a vitamin he called it "vitamin B<sub>2</sub>" Vitamin B<sub>2</sub> is used extensively in this sense in the German literature Development of biologic methods has also influenced the usage of terms Bourquin and Sherman<sup>24</sup> proposed a method for the determination of vitamin G, using the rat as the experimental animal This method has been used extensively to determine the vitamin G content of foods and pharmaceutical preparations In 1933 Booher<sup>25</sup> concluded that the Bourquin-Sherman method for the vitamin G determination was a measure of flavin In summary it may be stated that the antiberiberi vitamin has been called "vitamin B" and "vitamin B<sub>1</sub>" "Vitamin B<sub>2</sub>" and "vitamin G" have both been used to designate that part of the B complex, other than B<sub>1</sub>, to be synonymous with flavin and to be synonymous with the pellagra-preventive factor In recent publications dealing with these factors, authors have frequently found it necessary to explain the system of nomenclature that they have been using

The Committee on Vitamin Nomenclature made the following recommendations to the American Society of Biological Chemists and the American Institute of Nutrition, at their 1937 annual meetings

1 That the vitamin which is recognized as a specific in the prevention or cure of beriberi in man and polyneuritis in experimental animals, and which has been identified as consisting of a 2 methyl 4 amino pyrimidine group and a 4 methyl 5 B hydroxy ethyl thiazole group joined by a methylene group through carbon atom 5 of the pyrimidine ring and the nitrogen atom of the thiazole ring, be designated as 'B<sub>1</sub>' and that the term 'B' without a subscript be no longer used

2 That the compound identified as "6,7-dimethyl-9-(d-riboityl) isoalloxazine" be designated as "riboflavin," and that the terms "vitamin B" or "vitamin G" be no longer used

3 That the term "pellagra-preventive factor" or "P-P factor" be used to designate the nutritional factor effective in the prevention of human pellagra The use of the term "pellagra" shall be restricted to pellagra in man and shall not be used, even though qualified, in referring to similar syndromes in other animals

These recommendations were approved by both societies but final adoption was held in abeyance until the reactions to these proposals of other interested groups could be ascertained The term "riboflavin" had previously been adopted by the Council on Pharmacy and Chemistry<sup>26</sup> The terms "vitamin B<sub>1</sub>," "riboflavin" and "pellagra-preventive factor," as already defined, will be used in the remainder of this paper Designation of the other factors will be in accordance with what appears to be the most popular usage

#### INTANGIBLE MEMBERS OF THE VITAMIN B COMPLEX

Evidence of the existence of additional members of the B complex has largely been obtained by separations effected by selective adsorption, differences in stability to heat in mediums containing varying proportions of acid and alkali, and the response of rats, pigeons and growing chicks fed various types of diets Feeding experiments differ in so many important details that a satisfactory appraisal or correlation of closely related investigations is not possible While other factors or preparations could be discussed, it seems desirable to limit this brief presentation to the following

#### VITAMIN B<sub>3</sub>

Williams and Waterman<sup>27</sup> described vitamin B<sub>3</sub>, although its existence was noted by Schaumann,<sup>28</sup> Cooper<sup>29</sup> and Emmett and McKim<sup>30</sup> in their work relating to the B requirements of the pigeon Williams and Waterman found that pigeons fed a diet of polished rice supplemented with autoclaved yeast and a vitamin B<sub>1</sub> concentrate did not gain weight The same diet supplemented with air-dried brewers' yeast or whole wheat permitted a satisfactory growth response Williams and Eddy<sup>31</sup> proposed the name "vitamin B<sub>3</sub>" for this growth-promoting factor Vitamin B<sub>3</sub> deficiency is characterized by a decline in the body weight, which can be rapidly restored by the addition of proper sources of the vitamin to the diet, and there also follows an improvement in the condition of the feathers, appetite and general activity

Concentrates<sup>32</sup> with vitamin B<sub>3</sub> activity have been prepared from liver by extraction with dilute alcohol and adsorption of the active material on fullers' earth The factor is more heat labile<sup>32</sup> than vitamin B<sub>1</sub>, for when yeast is treated with alkali before it is dried at temperatures ranging from 20 to 60 C, practically all vitamin B<sub>3</sub> activity is lost while vitamin B<sub>1</sub> is still retained It is soluble in water and dilute alcohol

21 Kuhn Richard Reinemund Karl and Weigand Friedrich Synthese des Lumilactoflavins Ber chem Gesellsch 67 1460 1462 (Aug) 1934 Kurrer P Salomon H Schopp K Schlittler E and Fritzsche H Ein neues Bestrahlungsprodukt des Lactoflavins Lumilichon Helvet chem acta 17 1010 1013 (Oct) 1934 Synthese Lactoflavins ähnlicher Verbindungen ibid 17 1165 1169 (Oct) 1934

22 Nomenclature adopted by the Biochemical Society in 1927 Dutcher R A Vitamin B Terminology Science 68 206 209 (Aug 31) 1928 Note on the Nomenclature of the Vitamins of the B Complex Vitamins Brit Research Council 1932 p 118

23 Dutcher R A Vitamin B Terminology Science 69 671 (March 8) 1929

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25 Booher Lela L The Concentration and Probable Chemical Nature of Vitamin G J Biol Chem 102 39 46 (Sept) 1933 107 591 597 (Nov) 1934

26 Riboflavin the Accepted Name for Vitamin B J A M A 108 1340 1341 (April 17) 1937

27 Williams R R and Waterman R E The Composite Nature of Vitamin B Proc Soc Exper Biol & Med 25 13 (Oct) 1927 The Tripartite Nature of Vitamin B J Biol Chem 78 311 322 (July) 1928

28 Schaumann H Further Contributions to the Etiology of Beriberi Tr Soc Trop Med & Hyg 5 59 75 (Dec) 1911

29 Cooper E A On the Protective and Curative Properties of Certain Foodstuffs Against Polyneuritis Induced in Birds by a Diet of Polished Rice J Hyg 12 436 462 (Dec) 1912

30 Emmett A D and McKim L H The Value of the Yeast Vitamin Fraction as a Supplement to a Rice Diet J Biol Chem 32 409 419 (Dec) 1917

31 Williams R R and Eddy W H A Report Carnegie Institution of Washington Year Book 27 378 June 1927 July 1928

32 Carter C W and O'Brien J R Maintenance Nutrition in the Pigeon Vitamin B<sub>3</sub> Concentrates Biochem J 30 43 47 (Jan) 1936

It is present in yeast, liver, whole grains and malt but not in malt extract

The necessity for this factor has been demonstrated with the pigeon, and, while experimental evidence has been presented to support the view that it is required by the chick,<sup>33</sup> the validity of this evidence has been questioned.<sup>34</sup>

#### VITAMIN B<sub>4</sub>

Vitamin B<sub>4</sub> is concerned with the prevention of a specific paralysis in rats and chicks. Reader<sup>35</sup> found that if rats were fed a vitamin B deficient diet supplemented with autoclaved marmite, polyneuritis developed. When these animals were treated with a B<sub>4</sub> concentrate,<sup>36</sup> the typical symptoms of polyneuritis were relieved, but they still exhibited a condition of malnutrition characterized by a hunched back, lack of coordination and red swollen paws. This condition could be cured by administering a concentrate from yeast treated in a manner designed to free it from vitamin B<sub>1</sub>. She proposed the name vitamin B<sub>4</sub> for this new factor and later changed the designation to B<sub>4</sub>.<sup>37</sup> Failure in attempts to repeat and confirm Reader's observations led certain British investigators<sup>38</sup> to doubt the existence of vitamin B<sub>4</sub> and to conclude that the characteristic symptoms were a chronic vitamin B<sub>1</sub> deficiency which could be cured by large doses of vitamin B<sub>1</sub>. However, a group of Wisconsin investigators<sup>39</sup> confirmed and extended Reader's original observation with rats subsequent to a demonstration that this factor was required by the chick.<sup>40</sup>

This factor has been concentrated from aqueous extracts of yeast<sup>41</sup> and defatted liver<sup>39a</sup> by adsorption on active charcoal in an acid medium and elution with ethyl alcohol. It is very soluble in water, insoluble in fat solvents and labile to autoclaving in alkaline mediums.

#### VITAMIN B<sub>5</sub>

Carter, Kinnersley and Peters<sup>42</sup> described an alkali heat-stable, slightly water-soluble factor present in yeast which prevented loss in weight in pigeons fed a B deficient diet supplemented with vitamins B<sub>1</sub> and B<sub>2</sub> (heat stable fractions). They designated it vitamin B<sub>5</sub>. It differed from vitamin B<sub>3</sub> in that it was more stable to heat and alkalis. Vitamin B<sub>5</sub> permitted only weight maintenance of the pigeon, and the addition of vitamin B<sub>3</sub> was necessary for increase in weight. There appear to be no other investigations relating to this vitamin.

#### VITAMIN B<sub>6</sub>

Goldberger and Lillie<sup>43</sup> described a dermatitis in rats which was produced when they attempted to demon-

strate deficiency of the pellagra-preventive factor with these animals. Later investigations indicate quite definitely that this type of dermatitis is not due to a deficiency of the P-P factor but to some other factor for which the term B<sub>6</sub><sup>43</sup> has been proposed. While that term is used here, the deficiencies described as being due to factor Y of Chick and Copping<sup>44</sup> the antidermatitis factor or vitamin II of Hogan and Richardson,<sup>45</sup> vitamin H of Boohar,<sup>46</sup> factor I of Lepkovsky, Jukes and Krause<sup>47</sup> and vitamin B<sub>6</sub> appear to be essentially the same.

The cutaneous symptoms developing from the use of diets deficient in vitamin B<sub>6</sub> are described as a symmetrical dermatosis affecting first the paws and tips of the ears and nose. These areas become red, swollen and edematous. It is variously described as florid dermatitis,<sup>48</sup> specific type of skin lesion,<sup>49</sup> rat dermatitis,<sup>40b</sup> pellagra-like condition<sup>50</sup> and rat acrodynia.<sup>19</sup>

Vitamin B<sub>6</sub> has been concentrated by fractional adsorption from aqueous extracts of yeast, tuktiki, rice bran, fish muscle and wheat germ,<sup>50</sup> by treatment with a large quantity of fullers' earth at pH 2.5 to 5.0 after the removal of vitamin B<sub>1</sub> and flavin. It is also adsorbed on activated carbon, from which it can be eluted with n-butyl alcohol.<sup>46</sup> It is described as an alkali heat stable dialyzable factor adsorbed on fullers' earth in acid solutions, destroyed by visible and ultraviolet rays, only slightly soluble in water and precipitated by phosphotungstic acid.<sup>50b</sup>

This dietary factor has been found necessary only in the nutrition of the rat. In limited investigations it has been found to be ineffective in the treatment of human pellagra,<sup>51</sup> nutritional dermatosis in chicks,<sup>4</sup> and blacktongue in dogs.<sup>52</sup> Whether a single or several compounds are responsible for this type of deficiency is not apparent. The Goldberger diet for rat pellagra has been shown to be deficient in a number of factors, but principally in riboflavin.<sup>53</sup>

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## THE FILTRATE FACTOR

In attempts to fractionate the whole vitamin B complex, it has been found that if B<sub>1</sub> and riboflavin are first removed, further fractionation can be accomplished by adsorption with fullers' earth. The fraction remaining after such adsorption is free from B<sub>6</sub> and has been designated the filtrate factor. This fraction has been found to be effective in the treatment of a nutritional dermatosis in chicks, blacktongue in dogs and human pellagra. Goldberger and Wheeler<sup>54</sup> produced blacktongue in dogs by feeding diets that had previously been found to be pellagra producing in human subjects. The blacktongue preventing value of foods has since been used in studying the distribution of the pellagra preventing factor. Norris and Ringrose<sup>55</sup> described a nutritional dermatosis in chicks which was characterized by eruptions about the eyes, mouth and feet. The symptoms could be cured by the addition of autoclaved yeast to the diet. This observation led to the further studies on the filtrate factor already referred to.<sup>56</sup> It seems inadvisable to attempt to interpret these observations on different species but it is not improbable that the so-called filtrate factor contains more than one nutritional essential and that one or more of these may be required to prevent symptoms of deficiencies in the chicken, the dog and man.<sup>57</sup>

## FACTOR W

Recently Elvehjem, Koehn and Oleson<sup>58</sup> have presented evidence of the existence in liver of a thermolabile substance necessary for the growth of the rat, which they believe to be different from any members of the B complex previously described. The name factor W has been proposed for this substance. The factor was precipitated from an aqueous liver extract by the addition of alcohol and ether or acetone. Rats fed a vitamin B deficient diet to which were added "ample amounts of vitamins B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub> and flavins" failed to grow unless a liver extract or alcohol-ether precipitate made from it was also included in the diet. The term B<sub>2</sub> is used in that paper to designate a substance believed to be "identical with or closely related to the human pellagra preventive factor." Further studies have resulted in concentration of the active constituent of the factor. In a paper by Halliday and Evans<sup>59</sup> the need for assuming the existence of a factor W has been questioned, but Elvehjem does not concur in the interpretation of the experimental data.

## COMMENT

Only two members of the vitamin B complex, vitamin B<sub>1</sub> and riboflavin, have been shown to be chemical entities. Only two members of the vitamin B complex, vitamin B<sub>1</sub> and the P-P factor, have been unequivocally linked with deficiency diseases in man. The demonstrated function of riboflavin in oxidation reduction systems, its wide distribution in living cells, its demonstrated relation to growth of rats and chicks and

the development of cataract in rats<sup>59</sup> indicate that it is probably an important nutritional essential for man. Clinical investigations have led to the conclusion that riboflavin is ineffective in the treatment of human pellagra<sup>60</sup> and animal experimentation leads to the conclusion that lack of this substance is not responsible for the development of blacktongue in dogs<sup>61</sup> or nutritional dermatosis in rats or chicks.<sup>62a</sup>

There is at present no conclusive evidence that blacktongue in dogs as produced on Goldberger and Wheeler's diet is not the analogue of pellagra in man. Evidence is accumulating which indicates that a nutritional dermatosis in chicks may be closely related to human pellagra. Elvehjem and Koehn have found that concentrates which will prevent chick dermatosis are also quite effective in curing blacktongue in dogs. Fouts, Lepkovsky, Helmer and Jukes found that the "filtrate factor" of Lepkovsky and Jukes, which had been demonstrated to be preventive of a chick dermatosis, was curative of human pellagra and of blacktongue in dogs. If the observations of Smith<sup>62</sup> which indicate that the P-P factor of Goldberger consists of two or more factors are confirmed, the exact relationships of the deficiency diseases in the dog and chick to human pellagra cannot be visualized.

The relation of vitamins B<sub>3</sub> and B<sub>5</sub> to other members of the B complex is not clear. If the nutritional requirements of the pigeon are similar to those of another avian, the chicken, a reassessment of the importance of these factors will be necessary to catalogue them properly with other factors. Since the original work on vitamin B<sub>4</sub> seems to have been disproved and attempts to confirm more recent work on this factor have not been reported and factor W has not been associated with any deficiency syndrome, the importance of these factors is also rather obscure.

## Glossary

- vitamin B<sub>1</sub> The antiberiberi vitamin—American nomenclature 2 The vitamin B complex—British nomenclature  
vitamin B<sub>2</sub> The antiberiberi vitamin—British terminology, almost universally used at present  
riboflavin A compound identified as 6,7 dimethyl-9 (d-1 ribityl) iso-alloxazine and essential for growth in chicks and rats and for the prevention of cataracts in rats  
P-P factor The nutritional factor effective in the prevention of human pellagra (Goldberger)  
vitamin B<sub>3</sub> 1 That fraction of the B complex other than B<sub>1</sub>—British 2 Synonymous with flavin, riboflavin and vitamin G 3 The pellagra preventive factor or factors believed to be identical with it which prevent blacktongue in dogs and a nutritional dermatosis in chicks 4 That part of the B complex consisting of riboflavin and B<sub>6</sub>  
vitamin G Same as vitamin B<sub>3</sub> but sometimes used to refer to riboflavin plus vitamin B<sub>6</sub>  
vitamin B<sub>5</sub> 1 A growth factor for the pigeon 2 A factor capable of curing specific paralytic symptoms in the rat and later called B<sub>4</sub>  
vitamin B<sub>4</sub> A factor associated with specific paralytic symptoms in rats and chicks  
vitamin B<sub>6</sub> A weight maintenance factor for the pigeon  
vitamin B<sub>7</sub> 1 An antidermatitis factor for rats (Gyorgy) 2 Vitamin B<sub>6</sub> has properties common to but is not necessarily identical with vitamin H of Kuhn and associates of Sherman and Booher and of Hogan Factor X of Chick and Copping Factor I of Lepkovsky and Jukes and antidermatitis factor of Hogan  
factor Y See vitamin B<sub>6</sub>  
vitamin H See vitamin B<sub>6</sub>  
vitamin F Synonymous with B<sub>1</sub> (Sherman) no longer used to designate any factor of the vitamin B complex  
factor W A growth essential for the rat  
factor I That part of the B complex other than B<sub>1</sub> and riboflavin which is adsorbed by fullers' earth under specified conditions. Contains B<sub>6</sub>.  
filtrate factor That fraction of the B complex remaining after adsorption of factor I. Contains chick dermatosis, blacktongue and I-P factors

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56 Koehn C J Jr and Elvehjem C A Further Studies on the Concentration of the Antipellagra Factor J Biol Chem 115 693 699 (May) 1937 Keenan Kline Elvehjem Hart and Halpin<sup>60</sup> Lepkovsky Jukes and Krause<sup>61</sup> Elvehjem and Koehn<sup>62</sup>

57 Fouts P J Lepkovsky Samuel Helmer O H and Jukes T H Successful Treatment of Human Pellagra with the Filtrate Factor Proc Soc Exper Biol & Med 35 245 (Nov) 1936 Lepkovsky Jukes and Krause<sup>61</sup> Goldberger and Wheeler<sup>54</sup> Elvehjem and Koehn<sup>62</sup> Since this paper was prepared a communication by C A Elvehjem R J Madden F M Strong and D W Woolley (J Am Chem Soc 59 1767 [Sept] 1937) reports that commercial preparations of nicotinic acid and nicotinic acid amide prepared from liver were found to be efficacious in the treatment of blacktongue in dogs

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60 Harris L J Flavin and the Pellagra Preventive Factor as a Separate Constituent of a Complex B Biochem J 29 776 781 (March) 1935 Dann<sup>61</sup>

61 Sebrell W H Hunt D J and Onstott R H Lactoflavin in the Treatment of Canine Blacktongue Pub Health Rep 52 235 239 (Feb) 1957

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## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

**I V C COD LIVER OIL CONCENTRATE IN OIL**—A concentrate of the nonsaponifiable fraction of cod liver oil in neutral oil, adjusted to a potency of not less than 58,800 units (U S P) of vitamin A per gram and not less than 5,800 units (U S P) of vitamin D per gram.

**Actions and Uses**—It possesses the therapeutic properties recognized for the vitamins present in cod liver oil.

**Dosage**—For the liquid: Daily prophylactic dose for the average infant and child, from 6 to 9 drops. The liquid is marketed with a dropper designed to supply 3 drops to the minimum. For the capsules: one capsule daily.

Manufactured by the International Vitamin Corporation, New York. The concentrate used is made under U S patent 1,690,091 (Oct. 30, 1928, expires 1945). U S trademark 314,818.

**I V C Cod Liver Oil Concentrate in Oil Vials 6 cc**—Each minimum (3 drops, 0.057 cc) contains not less than 3,330 units (U S P) of vitamin A and not less than 333 units (U S P) of vitamin D.

**I V C Cod Liver Oil Concentrate Capsules 3 minims**—Each capsule contains 3 minims of I V C cod liver oil concentrate in oil, adjusted to a potency of not less than 10,000 units (U S P) of vitamin A and 1,000 units (U S P) of vitamin D per capsule.

**I V C Cod Liver Oil Concentrate in Oil Bottles 60 cc**—Each minimum (3 drops, 0.057 cc) contains not less than 3,330 units (U S P) of vitamin A and not less than 333 units (U S P) of vitamin D.

**I V C COD LIVER OIL VITAMIN CONCENTRATE TABLETS**—A concentrate of the nonsaponifiable fraction of cod liver oil in the form of tablets, each having a vitamin potency of not less than 3,150 units (U S P) of vitamin A and 315 units (U S P) of vitamin D.

**Actions and Uses**—I V C cod liver oil concentrate tablets possess properties similar to those of cod liver oil so far as these depend on the fat soluble vitamin content of the latter.

**Dosage**—Two to three tablets daily, or as prescribed by physician.

Manufactured by International Vitamin Corporation, New York. U S patent 1,690,091 (Oct. 30, 1928, expires 1945). U S trademark 314,818.

## Council on Foods

MANY PHYSICIANS HAVE INQUIRED ABOUT THE VITAMIN C CONTENT OF CANNED FRUIT JUICES. IN ORDER TO OBTAIN FURTHER INFORMATION ON THIS POINT DR. E. M. BAILEY OF THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION, NEW HAVEN, HAS SUPPLIED COMPARATIVE DATA ON THE CEVITAMIC ACID CONTENT OF COUNCIL ACCEPTED PRODUCTS BY CHEMICAL TITRATION. IN AUTHORIZING PUBLICATION OF THE PRESENT REPORT THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION OF THE COOPERATION OF DR. BAILEY AND HIS ASSOCIATE, DR. H. J. FISHER.

FRANKLIN C. BING, Secretary

### THE VITAMIN C CONTENT OF COMMERCIAL CANNED TOMATO JUICE AND OTHER FRUIT JUICES AS DETERMINED BY CHEMICAL TITRATION

Since the days of Lind and others, nearly 200 years ago, it has been known that many fresh fruits and vegetables are effective antiscorbutic foods. At the present time fresh orange juice is commonly used as a routine source of vitamin C in the feeding of infants. The question frequently has been raised whether canned orange juice, or other canned fruit juices, also could be used. Vitamin C is readily destroyed by oxidation, particularly on heating. In 1918, however, Hess and Unger<sup>1</sup> found that canned tomatoes, which were fed to infants after being strained through a sieve, were a good source of vitamin C. It is significant that tomato juice and citrus fruit juices are acid in reaction; in this type of medium it has been found that the vitamin C activity is retained much better than in a neutral or alkaline medium. Commercially canned fruit juices (and tomato juice is to be considered as the juice of a fruit) have been shown to contain appreciable quantities of

vitamin C when precautions have been taken to prevent the destruction of the vitamin during the canning process. In general, the conservation of the vitamin C is accomplished by raising the temperature of the juice rapidly, in order to drive out dissolved air and to destroy the "oxidase" which catalytically destroys vitamin C,<sup>2</sup> and by performing the canning operations under reduced pressure or in an atmosphere of steam. The principles by which the conservation of vitamin C may be effected have now become well known, but there is still little information available regarding the actual vitamin C content of commercially available canned fruit juices. The purpose of the present report is to provide some evidence on this point.

**Method**—The canners of accepted fruit juices accordingly were asked to provide the Council with samples of their products; the response was unanimous. There were thus made available for examination eight brands of canned orange juice, three brands of canned lemon juice, eight brands of canned grapefruit juice, three brands of canned pineapple juice and seventeen brands of canned tomato juice. A much larger number of brands of these products stand accepted by the Council, but many of these represent private label brands of accepted products. The present survey, therefore, covers all products of this type which on Sept. 1, 1937, were privileged to display the seal of the Council on Foods.

The vitamin C content was determined by titration with 2,6-dichlorophenolindophenol, according to the method of Bessey and King.<sup>3</sup> This method has been reported to give satisfactory results with many different plant products. Bessey and King, for example, found that the results obtained by titration with the dye, as compared with those obtained by assay with guinea pigs, were in good agreement. Examination was made of the following foods, of interest in connection with the present report: lemon juice, grapefruit, oranges and tomato juice. Daniel Kennedy and Munsell<sup>4</sup> obtained comparable results with the biologic assay and the chemical titration method for the determination of the vitamin C content of orange juice and both fresh and canned tomatoes. Hou<sup>5</sup> also reported good agreement between the results obtained by titration and by assay of the juice of various varieties of the orange. Guerrant, Rasmussen and Dutcher<sup>6</sup> concluded that lemon juice, orange juice, grapefruit juice and fresh pineapple juice showed values by the chemical titration method which were in close agreement with those by the usual biologic assay. Canned pineapple juice gave slightly higher values by titration, probably because of the presence of interfering substances. In general, it may be concluded that the 2,6-dichlorophenolindophenol titration method for the determination of the vitamin C content of many canned fruit juices gives results which are a satisfactory index of the actual vitamin C content, for certain products, however, the results by titration may be slightly high.<sup>7</sup>

**Results**—The results of the determinations are presented in the accompanying table, where information about the ash content and date of packing (when provided) of each product also is recorded. The analyses were made during August 1937, so it is possible in many instances to calculate the time of storage of the samples. The tomato juice examined was in all cases almost a year old. The other canned juices in general had been stored for shorter periods.

Bearing in mind the possible limitations of the method used, the figures show that all brands of the canned fruit juices

2. Elmer Stotz, C. J. Harter, and C. G. King (A Study of Ascorbic Acid Oxidase in Relation to Copper) *J. Biol. Chem.* 119: 511 (July 1937) describe experiments which appear to show convincingly that the oxidase activity is not due to an enzyme but can be attributed to traces of copper present in combination with protein material. The activity of a mixture of copper and albumin was destroyed by heat and it also assumed other characteristic properties of enzymes.

3. Bessey, O. A., and King, C. G. The Distribution of Vitamin C in Plant and Animal Tissues and Its Determination, *J. Biol. Chem.* 103: 687-698 (Dec.) 1933.

4. Daniel Esther P. Kennedy, Mary H. and Munsell, Elizabeth. Relative Vitamin C Content of Orange and Tomato Juices Determined Chemically and Biologically, *J. Home Econ.* 28: 470-474 (Sept.) 1936.

5. Hou, H. C. Some Differences in the Values Obtained by Chemical and Biological Assays of Vitamin C in Certain Foods, *Chem. Ind.* 9: 291-297 (Aug.) 1935.

6. Guerrant, A. B., Rasmussen, R. A., and Dutcher, R. A. The Value of the Chemical Titration Method in Determining the Potency of Certain Food Substances, *J. Nutrition* 6: 667-675 (June) 1935.

7. In a report on vitamins to the Association of Official Agricultural Chemists, E. M. Nelson has pointed out (*J. A. Off. Agr. Chem.* 20: 206-208 (May) 1937) that the chemical method for the determination of vitamin C is not specific. The application of the chemical method therefore is limited to those food products for which it has been shown to compare well with bio-assays to yield reliable results.

1. Hess, A. F., and Unger, L. J. Canned Tomatoes as an Antiscorbutic. *Proc. Soc. Exper. Biol. & Med.* 16: 1 (1918). Scurvy VIII. Factors Affecting the Antiscorbutic Value of Food. *Am. J. Dis. Child.* 17: 221 (April) 1919.

examined contained appreciable quantities of vitamin C. The eight different brands of canned orange juice contained from 0.31 to 0.56 mg of vitamin C per cubic centimeter. The average was 0.44, the median, 0.43 mg per cubic centimeter. Three samples of canned lemon juice contained from 0.41 to 0.58 mg of vitamin C per cubic centimeter, the average was 0.52 mg per cubic centimeter. The eight brands of canned grapefruit juice examined contained from 0.29 to 0.42 mg of vitamin C per cubic centimeter, with an average value of 0.37 and a median of 0.40 mg per cubic centimeter. Three brands of canned pineapple juice contained from 0.10 to 0.18 mg per cubic centimeter, with an average of 0.14 mg. Seventeen samples of canned tomato juice contained from 0.13 to 0.29 mg of vitamin C per gram. The average value was 0.20 mg per gram and the median was the same. In terms of the average approximate number of international units of vitamin C per hundred cubic centimeters, these figures become: pineapple juice 300, tomato juice 400, grapefruit juice 750, orange juice 900 and lemon juice 1,000.

**Interpretation.**—There are many factors which affect the cevitamic acid concentration of fruit juices. The vitamin C content of fresh fruits may be expected to vary according to the variety of the fruit, the conditions under which the crop has been grown, the degree of ripeness and other factors.<sup>8</sup> After being expressed from the fruit, the vitamin C potency of the juice decreases on standing.<sup>9</sup> Canned juices are subject to the additional possibility of the loss of some vitamin C during the canning process. There probably is some loss of vitamin C of canned juices even when they remain in the unopened can.<sup>10</sup>

The vitamin C requirements of man are not known with any degree of accuracy. It has been estimated<sup>11</sup> that from 100 to 200 international units of vitamin C per day will protect an infant from scurvy, and that from 800 to 1,000 international units is the usual intake of the breast fed normal infant, or for the bottle fed baby receiving the customary quantities of orange juice. Everson and Daniels<sup>12</sup> have suggested that from 2,000 to 3,000 international units of vitamin C a day are necessary in order to attain maximum retention of vitamin C in children of preschool age. This may be an index of the optimal requirements, but further work will be necessary before the minimum and optimal requirements are more thoroughly established. It has been estimated that 300 international units of vitamin C is an amount which will prevent scurvy in an adult. Larger quantities are considered desirable for normal nutrition. Rose<sup>13</sup> has suggested that a person taking 3,000 calories a day also should have at least 600 international units of vitamin C. Some workers<sup>14</sup> believe that a desirable vitamin C intake for adults would be in the neighborhood of 1,200 international units. Computations of the probable vitamin C intake from uncooked foods used in ordinary "good" diets show that 1,000 international units is more likely to be the actual intake. It is thus apparent that the estimated vitamin C requirements or the usual vitamin C intakes show wide variation.

If it is considered that about 1,000 international units of vitamin C (or 50 mg of cevitamic acid) is a suitable allowance for adults, it readily can be computed that the entire vitamin C requirement could be satisfied by the consumption of about 350 cc of canned pineapple juice, 250 cc of canned tomato juice, 125 cc of canned grapefruit juice, 110 cc of canned orange juice or 100 cc of canned lemon juice. Except for the lemon juice, which is used largely as a flavoring material, it would be possible easily for amounts of these fruit juices to be taken

that would cover all, or nearly all, of the average adult requirements for vitamin C. This, of course, is not essential because there are other foods in the ordinary diet which also provide this vitamin. The point is emphasized by such figures, however, that all the fruit juices under consideration are excellent sources of vitamin C. Canned orange juice is a little more than twice as potent in vitamin C as canned tomato juice. Canned grapefruit juice has a vitamin C potency only slightly less than that of canned orange juice. Canned pineapple juice is about one-third as potent in vitamin C as canned orange juice.

It has long been customary to consider the desirable intakes of vitamin C for infants in terms of fresh orange juice. The vitamin C content of fresh orange juice has been found<sup>15</sup> to vary from about 0.40 or less to 0.60 or more mg per cubic

The Vitamin C Content of Commercially Canned Fruit Juices

No.	Packed	Ash per Cent	Vitamin C Mg per Cc
1 Canned Orange Juice			
1	February 1937	0.48	0.31
2	April 1937	0.42	0.40
3	October 1936	0.45	0.41
4		0.56	0.42
5	July 1937	0.42	0.44
6		0.44	0.46
7	July 1937	0.47	0.55
8		0.49	0.56
2 Canned Lemon Juice			
1	June 1937	0.31	0.41
2		0.34	0.58
3		0.35	0.58
3 Canned Grapefruit Juice			
1		0.31	0.29
2		0.32	0.32
3	April 1937	0.38	0.34
4	March 1935	0.44	0.40
5	January 1937	0.50	0.40
6	February 1937	0.42	0.41
7	January 1937	0.49	0.41
8	May 1937	0.47	0.42
4 Canned Pineapple Juice			
1	Summer 1936	0.47	0.10
2	August 1936	0.42	0.15
3	June 1937	0.44	0.18
5 Canned Tomato Juice			
			Mg per Gram
1	August 1936	1.08	0.13
2	September 1936	1.01	0.15
3	August 1936	1.24	0.16
4	September 1936	1.08	0.16
5	September 1936	1.07	0.17
6	September 1936	1.28	0.17
7	August 1936	1.28	0.17
8	Summer 1936	1.04	0.18
9	Summer 1936	1.32	0.20
10	September 1936	1.14	0.21
11	September 1936	1.08	0.22
12	September 1936	1.25	0.22
13	September 1936	0.88	0.22
14		1.19	0.22
15	September 1936	1.14	0.23
16	September 1936	1.10	0.23
17	September 1936	1.14	0.29

centimeter. The question sometimes is asked: How much canned orange juice or canned tomato juice should be substituted for fresh orange juice? From the figures available, it would appear that canned orange juice is only slightly less potent in vitamin C than the fresh juice from which it is made. Approximately two and one-half volumes of canned tomato juice should be given in order to provide the vitamin C equivalent of one volume of fresh orange juice. If other juices are to be substituted, it is probable that the substitution could be made, other things being equal, on the basis of the vitamin C content. In large clinics where suitable laboratory facilities are available the vitamin C content of products under consideration could readily be estimated by chemical titration.

#### SUMMARY AND CONCLUSIONS

The vitamin C content of a number of commercially canned fruit juices has been determined by chemical titration, the method of Bessey and King being used. The specimens analyzed represented all the brands that stood accepted by the Council on Foods on Sept. 1, 1937. The results have been recorded and an interpretation of their significance has been made. All the products examined may be considered excellent sources of vitamin C.

15 Daniel Esther P. and Rutherford Marjorie B. Ascorbic Acid Content of a Number of Citrus Fruits. *J. Agric. Res.* 54: 689-693 (May) 1937.

8 Tripp Francis, Satterfield G. H. and Holmes A. D. Varietal Differences in the Vitamin C (Ascorbic Acid) Content of Tomatoes. *J. Home Econ.* 29: 258-262 (April) 1937.

9 Mack M. J. Fellers C. R. Machinn W. A. and Bean D. A. Vitamin C Content of Dairy Orange Beverages. *Food Research* 1: 223-230 (May/June) 1936. Daniel Kennedy and Munsell.

10 Daniel Esther P. and Rutherford Marjorie B. Effect of Home Canning and Storage on Ascorbic Acid Content of Tomatoes. *Food Research* 1: 341-347 (July/Aug.) 1936.

11 Congili G. R. The Vitamin Requirements of Man. *J. Am. Dietet. A.* 13: 195 (Sept.) 1937.

12 Everson Gladys J. and Daniels Amy L. Vitamin C Studies with Children of Preschool Age. *J. Nutrition* 1: 15 (July) 1936.

13 Rose Mary S. A Laboratory Handbook for Dietetics, ed. 4. New York: Macmillan Company, 1937, p. 25.

14 van Eekelen Marie. On the Amount of Ascorbic Acid in Blood and Urine. The Daily Human Requirements for Ascorbic Acid. *Biochem. J.* 30: 2291 (Dec.) 1936. Heinemann Martin. On the Relation Between Diet and Urinary Output of Thiosulfate (and Ascorbic Acid).

11 Human Requirements for Vitamin C. *ibid.* 30: 2299 (Dec.) 1936.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 26, 1938

## A NATIONAL HEALTH PROGRAM

Last week the Technical Subcommittee on Medical Care—the names of the members of which are not supplied—turned over to Miss Josephine Roche, head of the Interdepartmental Committee to Coordinate the Health and Welfare Activities of the United States government, a national health program and some proposals toward its pattern, which was sent to the President. The complete statement appears on pages 656 to 665 of this issue of THE JOURNAL.

The report points out that the committee was charged with assessing the state of the nation's health, to define needs which are not being met through current practices and to outline proposals through which the nation's health may be improved. The report leans largely on the national health survey made by the United States Public Health Service. That survey emphasized the loss to the public from disabling illness and a deficiency of hospitalization for the relief group. It pointed out that families with incomes in excess of \$3,000 have medical care for 83 per cent of the people, while relief families have medical care for only 70 per cent. Obviously, we would point out, if 17 per cent of families with sufficiently large incomes to obtain medical care did not do so, the actual deficit for medical care not received by relief families was only 13 per cent.

The present program and proposals seem to indicate that there are many cases in which families are without occupation because of illness. The reverse might also be true, namely, they were ill because of lack of an occupation which would enable them to purchase food, fuel, clothing, shelter and adequate medical care. It is again emphasized that sickness is among the most important causes of economic and social insecurity. "The amount of preventable sickness, the disability which continues, the volume of unattended disease, the rate of premature mortality and the prevalence of avoidable economic burdens created by sickness costs," says the statement, "justify grave concern." Later in the report even that statement is admitted to be disputable. Again let us emphasize that the reverse of the statement would seem to be much more nearly true. If people are pro-

vided with jobs and with adequate wages, they are quite able in most instances to supply themselves with satisfactory medical care. It is just as true that unemployment and dependency cause illness as it is true that illness causes unemployment and dependency.

The opening statement of the report points out that the present need, in the opinion of the committee, consists not in inadequate knowledge but in inadequate funds. From this it is concluded that the effective distribution and utilization of health and medical services demands a national plan for the economic application of our resources in maintaining and improving health.

The report recognizes the great accomplishments of preventive medicine in the United States. It calls special attention to lack of improvement in mortality rates at the older ages and to the fact that our population is becoming older. It fails somehow to take into account that medical science has not yet found a way to control the degenerative diseases, the reason these diseases are so prevalent is the success of modern medicine in reducing mortality in the lower age levels.

The chief needs, it is said, are those in respect to maternity, infancy and childhood and those of the diseases which come on later in life. The report insists that from one half to one third of maternal deaths are preventable and that the death rates of infants in the first month of life can be cut in half. Just how this is to be done is not made apparent. Certainly maternal mortality among comparable races and in states with comparable climates is in most instances higher than that in the United States. In the United States the proportion of unattended births is less than 1 per cent, which compares favorably with the rate in any other country. Even in large cities where special campaigns have been carried out with all the necessary funds made available, it is apparently not possible to secure permanently such a large improvement in infant mortality during the first month of life. Even the application of the best available obstetric care, the provision of incubators for premature infants and the application of the best possible artificial or other feeding techniques will hardly cut in half the present rates. The report does not accept as suitable attention the care of midwives, although in some foreign countries, where maternal rates are presumably better than ours, midwives conduct most of the deliveries. It is stated that only two out of forty-nine state health officers declared facilities for maternal care in their states to be adequate, without any definition as to what constitutes "adequate." It is said that more than 1,100,000 births occur annually in families which are on relief or in which the income is less than \$1,000 a year. Is it conceivable that this distribution of the nation's wealth is to be permanent and that one half of the people of the nation are to be cared for always on a charity basis or is there hope that economic conditions may change so that people will again be able to assume the responsibility for some of their medical care?



Deaths from tuberculosis, the report claims, may be reduced 50 per cent by health supervision of workers in occupations predisposing to the condition, by attention to cases in the incipient stage and by medical and institutional care in early cases of the disease. It is reasonable to believe that a reduction of deaths from tuberculosis would require something more than medical service. Tuberculosis is more than any other a social disease related definitely to poverty, malnutrition, bad housing and similar conditions. Is it not reasonable to suggest that the economic aspects of tuberculosis from this point of view are even more the concern of the government than the provision of medical service? Indeed there is no other disease that has had the amount of medical service available that is available today in most of our states for tuberculosis. The attitude of social investigators in relationship to tuberculosis is certainly paradoxical. They cite the great gains that have been made against tuberculosis as an argument in behalf of state medicine, since the states' provisions for this disease are already so extensive. Yet now they cite tuberculosis as an example of failure to handle a serious disease satisfactorily.

Special attention is also paid in the report to the problems of pneumonia, venereal diseases and malaria. For pneumonia and the venereal diseases the United States Public Health Service has recently engaged in a nation-wide campaign and apparently considerable funds are already available for these conditions. To these campaigns the medical profession is contributing notably of time effort and funds. Moreover, recent reports from Great Britain indicate that it is the belief of British physicians that England lags at least five years behind the United States in relationship to the control of pneumonia, and in other diseases lags behind even further. The control of malaria is at first more of an engineering than a medical problem. In fact, it is alleged that a considerable amount of money now available for malaria through various governmental sources is being spent for the elimination of mosquitoes in areas where there is no malaria.

The report pays attention also to the degenerative diseases without, however, a sufficient analysis to indicate the basis for some of the claims that are made of possible improvement. For instance, arthritis and rheumatoid disorders, if we are to believe European reports, are much more of a problem in countries with elaborate systems of sickness insurance and state medicine than they are in this country. Moreover, medicine has not yet evolved any single specific method of treatment or cure for these conditions, which continue to be of multiple origin and which involve a definite percentage of failure even with the best of treatment.

The report seems to establish a relationship between low income and annual days of disability per person which is based on the survey conducted by the United States Public Health Service yet in this report the rate of 89 days of disability for those with an income

under \$1,200 is below that of the insured in Great Britain, where there is "an average annual absence of ten days for men and twelve days for women."

As a result of its considerations, the committee finds that there is a sufficient number of physicians in the country but that they could be better distributed—a fact which has been repeatedly emphasized in innumerable reports during the last twenty years. It is felt that the younger men insist on remaining in urban centers because professional and economic opportunities are greater and hospital facilities are available, and the people have higher average incomes. The cure for this seems to be that practice in the underprivileged areas must be made attractive from both professional and economic points of view before the young physicians can be expected to settle in these areas. True there are 1,300 counties without hospitals, and from this is drawn the conclusion that this measures the hospital service available. However, hospital facilities are not identical with county boundaries. It is said that existing institutions are grossly inadequate to meet the needs of the public in many parts of the country and that there is a deficiency of about 400,000 beds in the hospitals. The chief need, according to the report, is the construction of at least 500 hospitals of from thirty to sixty beds in rural and sparsely settled regions which have inadequate hospital facilities. Health and diagnostic centers are greatly needed in rural areas, if the committee's conclusions are accepted and apparently there should be an additional 250,000 beds for convalescent patients.

From the point of view of economics, the report recommends the meeting of two clear-cut needs: (1) appropriate arrangements to minimize the impact of sickness costs on individual families through distribution of the costs among groups of people over periods of time, (2) arrangements for services to be furnished to people who are without income, and for those who are otherwise able to maintain themselves but who cannot obtain necessary care through their own resources. This means essentially provision of medical service through social insurance or through systematic public assistance or through both devices. The report contains no estimate of the cost of the services that it proposes to set up, nor does it suggest the method by which the necessary funds are to be provided. Further taxes on payrolls and further general taxation, to finance the proposed services, will lead to economic dislocations that may aggravate the very conditions it is sought to remedy and bring more and more persons into the dependent class.

Essentially, then, the answer of this committee to the problem of medical care is sickness insurance and federal or other subsidy, or both. This proposed solution of the problem of medical care is not unique. Although the authors of this report indicate in their opening statement that they are not even mentioning the positive side of our present accomplishments in the field of medicine and health, the failure to present this

aspect of the subject gives their report a dismal tone beyond what the situation warrants. Our progress up to now, which is greater than that in any country that has abandoned our system in behalf of some socialized system of medical care, should cause hesitation in rejecting the pattern of progress that has brought such results, in favor of patterns that have been tried elsewhere with far less success.

This report, according to the Associated Press, was interpreted in some quarters as pointing the federal government toward a program of so-called socialized, state or tax-paid medicine similar to the present social security program, which already provides some measure of medical care and research. Interesting in this connection is the statement credited to President Roosevelt, in the Associated Press report, that "such a medical program would require twenty years for accomplishment." In this estimate the President would seem to be conservative.

#### THE NATIONAL COUNCIL'S PROPOSITION

In an address before the Annual Congress on Medical Education and Licensure held in Chicago last week, Dr. Willard C. Rappleye, dean of the Medical Faculty of Columbia and president of the advisory board for medical specialties, presented an extraordinary proposition.

There is urgent need for coordination of the various subdivisions of medical education and for better definition of the several areas of responsibility of national and state agencies, universities, hospitals and professional bodies dealing with portions of the whole program, if medicine in this country is to meet fully its obligations. The logical conclusion from the present more or less unrelated and frequently overlapping efforts is to secure a national coordinating body representative of the major activities in medical education. A National Council on Medical Education, Licensure and Hospitals should be created, made up of representatives of the universities, medical schools, hospitals, practicing profession, specialty boards, state licensing bodies and public health agencies.

He then pointed out that this council would study major educational needs, mobilize current opinions, formulate standards and advise everybody generally, including the government, on standards, methods and procedures. In this connection he said:

There are indications that the government may be urged or expected in one form or another to increase more than at present its financial support of medical services, teaching and research. It is important that the profession create in advance an agency for assisting in any such possibility.

Why the unusual haste in the promotion of this grandiloquent idea? The executive body of the Association of American Medical Colleges promptly expressed its approval of the measure in a special session and endeavors were made to obtain endorsement from the Federation of State Medical Licensing Boards and other bodies in convention at the same time as the Annual Congress on Medical Education and Licensure. The pressure placed on these bodies for speedy action on this proposal is unexplainable.

At present there is intense interest in graduate medical education. The American Medical Association, through its Council on Medical Education and Hospitals, is conducting a nation wide survey on the subject, week by week these unbiased objective reports are being published in *THE JOURNAL*. This is in accord with previous procedures for raising standards, stimulating activity and bringing about effective action toward improvement.

In the past thirty years the American Medical Association has expended more than a million dollars of its funds in raising the standards of medical education. Its actions have been efficient and with due regard for the principles of ethical medical practice. The various certifying boards which it is proposed to bring under this National Health Council are feeling their way gradually toward effective methods of operation with a view to raising the standards of specialistic practice. The Council on Medical Education and Hospitals has done much to unify and coordinate the activities of these certifying boards. The hospitals, the medical colleges, the licensing boards, the medical profession and most of the specialties in medicine seem to be adequately represented by organizations, democratically conceived and operated. It is inconceivable that they will delegate any part of their rights, functions or obligations to any supervisory council. The proposed body to dominate medical practice is created out of whole cloth, there is no indication as to who is to be its director nor any statement as to who will contribute the financial support for its conduct. Perhaps there is a desire to have available in a receptive position some group ready and willing to accept funds from the federal government for the control of medical practice, if, as and when such funds are legislatively devoted to this purpose. Certainly this hint is conveyed in no delicate manner in Dr. Rappleye's statement. The individual physicians of this country and the medical organizations that have already been mentioned will do well to consider most seriously the proposal offered to them by Dr. Rappleye before delegating their rights and ideals to any such superorganization as that which he proposes.

#### THE ADRENALS AND DIABETES

Thirty years ago Zuelzer<sup>1</sup> proposed the theory that the adrenals have an important part in the development of diabetes mellitus. He suggested that epinephrine and the internal secretion of the pancreas were mutually antagonistic, removal of the pancreas or suppression of its secretory function by disease would permit epinephrine from the adrenals to mobilize sugar, with resultant glycosuria. In view of the known hyperglycemic action of pharmacologic doses of epinephrine, this theory has enjoyed wide currency. Various pro-

<sup>1</sup> Zuelzer, G. Experimentelle Untersuchungen über den Diabetes mellitus. *Berl. Klin. Wchnschr.* 44: 474, 1907. Ueber Versuche einer spez. sc. Fermenttherapie des Diabetes. *Ztschr. f. exper. Path. u. Therap.* 5: 1908.

cedures, surgical or roentgenologic, directed toward suppression of secretion by the adrenal medulla have been performed in recent years in the hope of ameliorating clinical diabetes. The inadequate physiologic background of these methods and the dangerous, sometimes fatal, results of their application have been discussed previously.<sup>2</sup>

Rogoff, Ferrill and Nixon,<sup>3</sup> at the University of Chicago, have now tested Zuelzer's hypothesis experimentally to determine whether or not suppression of epinephrine secretion by the adrenals modifies the insulin requirement in diabetic animals. Epinephrine output was suppressed in a number of dogs by unilateral adrenalectomy followed by denervation and partial destruction of the medulla of the remaining adrenal. Experimental diabetes was induced by complete pancreatectomy. The animals were maintained on a constant diet, and the daily amount of insulin required to keep the glycosuria at a constant low level was determined over various periods up to two months. At the termination of each experiment the epinephrine output from the adrenals was determined, with the animal under pentobarbital sodium anesthesia, by collecting adrenal vein blood from a "cava pocket" according to the method of Stewart and Rogoff. The epinephrine content of this blood was ascertained by the effect of various dilutions on the excised intestinal strip of the rabbit and comparison with the effects of solutions of epinephrine of known concentration.

The Chicago investigators found that the insulin requirement of their animals bore no relation to the rate of epinephrine secretion. Dogs in which the output of epinephrine was one seventieth or one seventy-fifth of the normal showed as great an insulin requirement as control dogs with a normal rate of secretion. Not only do these observations controvert the thesis that the adrenal medulla plays a major part in diabetes, but Rogoff and his collaborators made an important and curious discovery. Some of the control animals, in which only pancreatectomy had been performed, were found to have a markedly diminished output of epinephrine. Apparently, the activity of the adrenal medulla had been spontaneously suppressed.

Accordingly, Rogoff and Nixon<sup>4</sup> investigated this phenomenon further. Four series of animals were employed, the dogs in one were depancreatized and treated with insulin, another consisted of untreated pancreatectomized animals, the third was made up of normal animals fed a supplement of 100 Gm of sugar daily and treated with insulin, the fourth was like the third, but these dogs did not receive insulin. Among sixteen depancreatized animals treated with insulin, twelve showed a spontaneous reduction in epinephrine output to from one-fourth to one-seventieth the normal

average (or less). Only three of thirteen untreated pancreatectomized animals showed a similar reduction, but as these did not survive as long as the treated dogs this difference may not be significant. Of the animals which were not operated on, four out of five which received sugar and insulin and two out of five which did not receive insulin were found also to secrete little or no epinephrine. In animals with a considerable reduction in output, stimulation of the splanchnic nerve led to increased secretion to or above the normal rate, demonstrating that the adrenal glands had retained a large measure of their capacity to respond to stimulation.

The mechanism by which the reduction in adrenal medullary activity occurs during the diabetic state is not yet clear, though the effect of ingestion of excess sugar alone suggests, as Rogoff points out, that the liver may have a part in this phenomenon. Regardless of the eventual explanation, the observations of the University of Chicago workers certainly lend no support to those who would treat diabetes by interfering with the function of the adrenals. Nature, as usual, has anticipated them!

### Current Comment

#### SYPHILIS AND GONORRHEA IN SWEDEN

In 1913 the number of new cases of gonorrhea reported in Sweden was 10,271 and of syphilis 1,941. Up to 1918 both diseases increased and in this year there were 16,626 cases of gonorrhea and 4,006 of syphilis. New laws for control then came into effect, but in 1919 the increase continued with 20,651 cases of gonorrhea and 5,976 of syphilis. From that time, however, the number of cases of syphilis has fallen more or less steadily until only 356 new cases of syphilis were reported in 1936. Gonorrhea, after decreasing abruptly in 1920 to 14,894 (largely the result probably of the ending of the war), remained approximately stationary (11,957 cases in 1936) in spite of the rapid drop in the frequency of syphilis. The failure of gonorrhea to decrease is probably partially due, as Forssman has pointed out, to defective diagnosis and lack of specific treatment. Additional factors, however, as Strandberg<sup>1</sup> mentions, probably play a part. Freer sexual relations are now more common than in the past. Formerly the female patients with gonorrhea generally came from the lower social groups but now the disease is much more frequently seen in the higher classes, whether measured by economic or by social situation. Furthermore, the first infection, especially in women, seems to arise at a definitely earlier average age. These experiences indicate that decrease in frequency of syphilis is not necessarily associated with decrease in gonorrhea and that there are apparently certain distinct problems in control which do not react similarly to the same measures. Whether the causes are as outlined by Strandberg or whether they involve other factors should be determined. Certainly the facts indicate the wisdom

2. In Defense of the Adrenals editorial J A M A 106 294 (Jan 25) 1936

Rogoff J M, Ferrill H W and Nixon E N. The Adrenals and Experimental Diabetes Arch Int Med 60 805 (Nov) 1937

4. Rogoff J M and Nixon E N. Epinephrine Output from the Adrenal Glands in Experimental Diabetes Am J Physiol 120 440 (Nov) 1937

1. Strandberg I. Ueber die Behandlung der Gonorrhoe Acta dermat venereol 18 696 (Dec) 1937

of the policy of attempting to combat one disease at a time, rather than the simultaneous elimination of the two, merely because of their common venereal origin

### THE CORNELL CANCER TREATMENT

Last week newspapers contained an announcement to the effect that Dr. Beaumont Cornell of Fort Wayne, Ind., had discovered an amazing treatment for cancer. Briefly the treatment consists of the injection into patients with cancer of a product which he has labeled Anomin and which represents extracts made from the testicular and ovarian tissues of cattle. According to available reports, Dr. Cornell called together a group of physicians at noon on February 18 and read to them a manuscript, after which a complete story of his work promptly appeared in the local newspaper. It was claimed for his new extract that it prevented the formation of metastases, that pain ceased and that tumors liquefied. The only evidence is the unsupported statement of the author, who, it seems, also arranged to have similar studies made in London. The work is all recent, time is required to determine whether or not cancer is really cured in any patient. None of this work seems to have been suitably controlled. The methods of promotion and the publicity associated with the announcement of this method would seem to be wholly outside the usual accepted scientific procedures.

### CANCER MORTALITY IN CONNECTICUT

In May 1933 a tumor committee was appointed under the auspices of the Connecticut State Medical Society. The 1935 Connecticut legislature authorized the state department of health to create a division of cancer research. The program thus developed represents a joint cooperative effort on the part of the state medical society and the Connecticut State Department of Health. As a result a report<sup>1</sup> has been published showing that the mortality from cancer in Connecticut has demonstrated the same upward trend as observed elsewhere. The increment in rate is 1 693 deaths per hundred thousand of population annually with a standard error of  $\pm 0.033$ . The crude rate in 1935 was 128.4 per hundred thousand, the highest ever recorded. On this basis cancer is the second largest cause of death in the state but affects primarily middle and late adult life. In spite of the gross increase, the rates for such sites as the skin, buccal cavity, stomach and liver for both males and females, and the uterus among females, have shown a slight downward trend since 1935. Other sites have shown a progressive increase. Speculation as to probable future trends of mortality from cancer among the sexes attracts considerable attention. There is evidence that in some localities the trend among females is beginning to level off while that among males continues upward. Much of the mortality among females is from cancer occurring in sites that are more readily accessible for diagnosis. This possibility, however, cannot be confirmed without observing the trend for at least another decade.

## Special Report

### A NATIONAL HEALTH PROGRAM AND SOME PROPOSALS TOWARD ITS DESIGN

A STATEMENT SENT BY MISS JOSEPHINE ROCHE, CHAIRMAN OF THE INTERDEPARTMENTAL COMMITTEE TO COORDINATE HEALTH AND WELFARE ACTIVITIES, TO THE PRESIDENT OF THE UNITED STATES

#### THE NEED FOR A NATIONAL HEALTH PROGRAM

##### I. INTRODUCTORY NOTE

The cost of illness and death in this country amounts annually to about 10 billion dollars, including in this total the combined costs of health services and medical care, loss of wages through unemployment resulting from disability and the loss of potential future earnings through premature death. On an average day of the year, there are 4 million or more persons disabled by illness. Every year 70 million sick persons lose over one billion days from work or customary activities. Such fragmentary but specific estimates are indicative of the economic loss resulting from sickness and premature death, but they give no adequate indication of the incalculable social consequences of ill health.

We are not unmindful of the brilliant advances which have been made in scientific knowledge. Nor do we overlook notable improvements in medical, public health, dental and nursing education, or in the progress of research. Nor do we underestimate the contributions of individuals and associations, lay and professional, in raising the standards of professional service. All of these advances are written large on the credit side of the ledger of national progress and they count heavily in the measure of our national resources.

But it is not the task of this Committee to merely praise for past performances and accomplishments. The Committee is charged with the duty to assess carefully the state of the nation's health, to relate what is being done against what can be done, to search out and define needs which are not being met through current practices, and to outline proposals through which the national health may be improved. Of necessity, therefore, this report deals primarily with the debit rather than with the credit side of the ledger—not by reason of any intent to give a distorted picture, but to discharge a specified task. Yet this limitation must be kept constantly in mind, lest otherwise the Committee be regarded as taking an unsoundly pessimistic view.

The Committee calls attention to the fact that illness precipitates large costs and enormous economic burdens, and that sickness is among the most important causes of economic and social insecurity. Sickness strikes at the basis of national vitality, the good health of the population is vital to national vigor and well being. The accomplishments of the past in health conservation are therefore secondary to the needs of the present and of the future. While great advances have already been made, enormous needs still prevail. The amount of preventable sickness and disability which continues, the volume of unattended disease, the rate of premature mortality, and the prevalence of avoidable economic burdens created by sickness costs justify grave concern.

Do the methods of public health and medical sciences offer no hope of further reducing the national burdens of illness? On the contrary, the Committee finds that the essential lack consists not in inadequate knowledge but in inadequate funds. Indeed, at some points, the resources exceed the need, but they are used to less than capacity while people in need go without service. There are economic barriers between those in need of service and those prepared and equipped to furnish service. We see in this field the well-known anomaly of need existing in the midst of plenty which is apparent in other phases of our national economy. The essential inadequacy in respect to health services is not in our capacity to produce but in our capacity

<sup>1</sup> Cancer Mortality in Connecticut. Connecticut State Department of Health, 1935.

to distribute The greater use of preventive and curative services which modern medicine has made available wait on the purchasing power rather than on the need of community or individual The effective distribution and utilization of health and medical services demands a national plan for the economic application of our resources in maintaining and improving health

#### II ACCOMPLISHMENTS OF THE HEALTH MOVEMENT

The present century has seen the development of the technique of disease prevention and has seen the technique widely applied by the physician and dentist in private practice and by a variety of organized voluntary agencies, and by local and state health departments through general practitioners as well as through specialized public health personnel—physicians, public health nurses, bacteriologists, sanitary engineers and others The achievements of organized effort in the prevention of disease are well known Yellow fever, which delayed the construction of the Panama Canal until Reed and his associates discovered the method of transmission, has been practically eliminated on this continent Deaths from typhoid fever and the diarrheal diseases have shown a striking decline following improvements in sanitation of the environment, control of water supplies, and pasteurization of milk Tuberculosis and diphtheria mortality has been greatly reduced through a variety of other procedures These and numerous other organized preventive efforts have operated hand in hand with concerted efforts directed to improvement of professional education, skill in diagnosis and care of disease, and to ever broadening scientific knowledge

The progress made in the control of disease is indicated by the downward trend of the death rate, which decreased from 18 per thousand in 1900 to 11 per thousand in 1935, representing a saving of about three quarters of a million lives a year This saving of life has taken place chiefly in childhood and in the years of early adult life, in which the preventable diseases have been most frequent In the period between 1900 and 1935, twelve years were added to the average expectation of life at birth

However, no significant increase occurred during this period in the average years of life remaining to persons of middle and advanced age The life expectancy at age 50 for white males in the original death registration states showed, between 1901 and 1929-1931, the almost negligible increase of seven one-hundredths of a year, for white females, the increase was eight tenths of a year

Lack of improvement in mortality at the older ages is of special moment because our population is "aging", the proportion of the population which is in the higher age groups is increasing This results from the combined effects of the declining birth rate, the decrease in childhood and early adult mortality, and the immigration of large numbers of adults in the first part of the present century

Mortality in the higher ages has not, in general, been declining On the contrary, the death rates from some important diseases of adult life have been increasing The phenomenon must be understood in light of the fact that the principal causes of death operating in the advanced years are not, in general, communicable but organic and chronic Measures designed to control the communicable diseases do not therefore strike directly at mortality in the higher ages, except insofar as they prevent permanent damage from communicable diseases in the earlier years of life Such chronic diseases as diabetes, and the diseases of the heart, blood-vessels and kidneys, which are associated with the degenerative changes of the aging process, have shown rising death rates In 1900, the death rate from cancer was 63 per hundred thousand of all ages, in 1936, the death rate was 108 per hundred thousand There is some doubt as to how much of this increase is real, and how much is spurious—reflecting improvements in accuracy of diagnosis and reporting In any case, there is sufficient evidence that at least a substantial part of the apparent increase is real to warrant grave concern In the same period, the death rate from diseases of the heart increased from 132 to 213 per hundred thousand, and diabetes mortality, from 10 to 22 per hundred thousand To some degree deaths from these diseases can be prevented

and deferred, and disability can be reduced, by early diagnosis and competent medical care in these diseases or in diseases which precede them

The great accomplishments of the recent past are a harbinger of the future But the hope for equal or even greater advance in the years ahead can be realized only if the changing nature of health needs is appreciated and only if appropriate adjustment is made in the methods to be used A new health program must be something more than merely an expansion of the old New measures must be used, directed against the new objectives Fortunately, new methods are not necessarily novel While the old has been practiced, the new has been subjected to experiment and practical trial so that a new program may depend principally on new applications of tried and tested procedures And though a new program must make further provision for still newer experimentation under appropriate conditions, the emphasis may still be laid upon well founded techniques

If time and occasion permitted we could present a detailed analysis of unmet needs for health services We could deal, item by item with each important cause of sickness and death, with each major type of service, with each class of cost Out of such an analysis could then be woven the fabric of a general program The Committee has reviewed the information available for such a categorical analysis Our study reveals that the principal needs can be more simply presented by casting them into two broad classes (1) needs in respect to maternity, infancy and childhood, which fall in a group by themselves though intimately related to (2) needs in respect to health services precipitated by specific causes of sickness, disablement and death not directly associated with childbearing or with the hazards of early life Accordingly, unmet needs are considered from these two approaches

#### III THE NEED FOR THE EXPANSION OF MATERNAL AND CHILD HEALTH SERVICES

*The Need for Better Maternal and Child Health Care*—The increasing proportion of persons in the older age periods has been accompanied by a decline in the proportion of children The conservation of maternal and child life is therefore especially imperative if we are to maintain in the future the proportion of persons in the productive ages necessary to an economically progressive nation A great opportunity to this end lies in the provision of adequate health services and medical care in maternity, in infancy, and in childhood

Today there is a great and unnecessary waste of maternal and infant life, impairment of health is widespread among mothers and children Physicians, after careful evaluation of causes responsible for the deaths of individual mothers, report that from one half to two thirds of maternal deaths are preventable It has been shown that the death rate of infants in the first month of life can be cut in half Knowledge of how life and health may be preserved is at hand, adequate demonstration of the practical application of knowledge with favorable results in the saving of lives and conservation of health has been made, the problem lies in finding the ways and means of making good care available to all in need of such care

*Maternal and Infant Mortality*—The health and security of children depend to great extent on the life and health of the mother and on the ability of the family to provide adequate food, shelter, clothing and medical care

Each year a birth occurs in the households of more than 2,000,000 families in the United States Each year, more than 75,000 infants are stillborn Each year, more than 69,000 infants die in the first month of life, 56,000 of these from causes associated with prenatal life or with the process of being born

Each year about 12,500 women die from causes directly connected with pregnancy and childbirth, and approximately 1,500 others who are pregnant or recently delivered die from such conditions as tuberculosis, chronic nephritis or heart disease As a result at least 35,000 children are left motherless, many of them to become dependent on the community, and many of them to become potential delinquents

The maternal mortality rate for the United States is high, in 1936 the rate was 57 per 10,000 live births, more than twice that of Sweden. Rates vary widely in different states, from

40 in Rhode Island and New Jersey to 91 in Arizona and 90 in South Carolina. In individual counties the range is even wider, from no deaths at all for a 5-year period to a rate of more than 200 per 10,000 live births. During the twenty-two years for which records are available, there has been but little decline, with the exception of the last six years during which there has been a slight but significant decrease due to reduction in the deaths from toxemia of pregnancy. This is the cause of maternal death which is most affected by prenatal care, its continued downward trend is dependent on the adequacy of such service. The deaths from causes associated with delivery have shown scarcely any decrease in twenty-two years. Deaths from hemorrhage have declined slightly, deaths from sepsis, which account for more than 40 per cent of all maternal deaths and which are largely preventable by good care before or at the time of delivery, have shown no significant decline.

During the twenty-one years for which records are available, great progress has been made in reducing the death rate of infants during the period between the second and twelfth month of life. But there has been but slight decline in the death rates of infants under one month of age and no decline in the rate of death on the first day of life. The deaths during the first month of life represent half of all infant deaths during the first year of life. Four fifths of the deaths under one month are prenatal or natal in origin and, therefore, closely associated with the causes of maternal mortality and morbidity.

There are probably 90,000 premature infants born alive each year in the United States. Of these at least two fifths die in the first month of life, representing half of all deaths which occur in the first month of life. It has been demonstrated that a large proportion of prematurely born infants may be saved by proper care.

It is estimated that a considerable proportion could be saved of the more than 75,000 stillbirths which occur each year. The causes of stillbirth are those associated with complications of pregnancy and abnormalities of labor. Reporting of stillbirths is still too incomplete and the criteria of diagnosis too lacking in uniformity to warrant discussion of trends. It is likely, however, that many more occur than are reported.

Though the mortality rate for infants between 2 and 12 months of age has been strikingly reduced for the country as a whole during the past twenty-two years, there are still areas and groups of the population in which the death rates from respiratory disease and gastro-intestinal disease are as high today as the rates for the whole country twenty years ago or even higher. The preventive measures so successfully applied in many urban and some rural areas should be made available to families in all cities and rural areas. Until 1929 the rural infant mortality rate was lower than the urban rate, in 1929 the urban rate fell below the rural rate, but there are still many cities with rates far too high. The infant mortality rate for the country as a whole can be reduced still farther.

**Inadequacy of Maternal and Infant Care**—A few salient facts brought out by recent studies will suffice to indicate the inadequacy of present provisions for maternity and infancy.

In 1936 nearly a quarter of a million women did not have the advantage of a physician's care at delivery. 15,000 of these were delivered by neighbors or relatives, 223,000 were delivered by midwives, most of whom are untrained and ignorant.

In 1937 of forty-nine state health officers responding to a questionaire only two reported the facilities for maternal care in their states as adequate. Forty declared the facilities to be definitely inadequate, seven found them inadequate in at least some important respects. In seventeen states the number of general practitioners of medicine who include obstetrics in their practice was reported as insufficient, and 43 health officers reported that there are too few specialists in obstetrics practicing in their states.

In 1936 71 per cent of the births in urban areas occurred in hospitals, in rural areas only 14 per cent were delivered in hospitals. About 200,000 births occur annually in families which live at least 30 miles from a hospital, often under transportation conditions that make it impracticable to take the mother to a hospital in emergency.

In 1937 2,900 prenatal centers in small cities or rural areas of thirty-three states financed by local, state and federal funds served the women of only 509 counties. 5,300 child health centers in thirty-six states provided service in only 740 counties. Local physicians were paid for the services in only 21 states. The services of specialists in obstetrics are provided for consultation with general practitioners in cases where the family is unable to pay for such care in only two or three states. Plans are being made for this service in a few other states.

Nurses care for women at time of delivery in only 190 rural counties

There is one public health nurse for every 5,000 persons in cities of more than 10,000 population, in smaller places and in rural areas there is only one nurse for every 14,000 persons. This is to be contrasted with the standard of one nurse for every 3,000 persons, a level reached in urban areas in states.

Seventy-five per cent of 118 health jurisdictions (urban or rural) reporting the volume of prenatal clinic service given in 1936 failed to meet a minimum standard for adequate prenatal care, over 50 per cent provided inadequate health supervision of infants through clinic care.

Twenty-five per cent of 200 health jurisdictions surveyed in 1936 provided no health services for the period of maternity and infancy.

In 1936 42 per cent of the births to rural women took place in areas having no official community health service of any kind.

It is estimated that more than 1,100,000 births occur in families which are on relief or have total incomes (including home produce on farms) of less than \$1,000 a year. Of these, more than 900,000 occur in rural areas or cities under 100,000 population and more than 200,000 in cities of 100,000 population or over. Many hospitals serving rural areas and small cities report that their maternity facilities are not used to capacity because of the inability of families to pay for such care.

**The Special Needs of Childhood**—In childhood, excluding the first year of life, the probability of dying is lower than at any subsequent age period in the entire life span, but the probability of being sick is greater in these than in the subsequent years of life. In eight large cities canvassed in the National Health Survey in 1935-1936, children 5 to 9 years of age experienced an illness rate (of cases disabling for one week or longer) which was 19 per cent higher than that of persons 65 years of age and over. Of these illnesses among children under 15 years of age, about 40 per cent were due to acute infectious diseases such as measles, scarlet fever, whooping cough, and diphtheria. Each year, about 15,000 children die from these four causes alone. Many cases can be prevented and many lives can be saved by the application of specific measures for the control of communicable disease, for protection of the milk supply, and for adequate health supervision. In addition to more effective provision of services from physicians, this involves provision of services which can be furnished by public health nurses, in the home and in clinics, with medical supervision and consultation.

Acute respiratory diseases—influenza, pneumonia, colds, tonsillitis—caused another 40 per cent of the disabling illnesses, among children under 15 years of age in the eight cities canvassed in the National Health Survey. The illness rate for this group of causes among children 5 to 9 years of age was twice as high as that of persons 65 years of age and over. Among children of the preschool period (1 to 4 years), pneumonia alone was the cause of 19 per cent of these illnesses due to acute respiratory disease. In the period 1930-1934, 18 per cent of all deaths among preschool children were due to this cause, a proportion between two and three times as high as that at any subsequent age period. To a great extent the pneumonia occurring in infants and young children, especially that resulting in death, is not the type amenable to known forms of serum treatment. However, illness due to pneumonia in early childhood can be greatly reduced by medical and nursing care of minor respiratory diseases, and deaths may be averted by skilled care when the disease occurs. For older children prompt and skilled care, early in the disease, typing of the infection, and provision of skilled service and when appropriate special serum treatment are essential.

It is estimated that there are at least six children in every 1,000 who are crippled or seriously handicapped by diseases or conditions such as poliomyelitis, tuberculosis, birth injuries, injuries due to accidents, rheumatic heart disease, and congenital deformities amenable to correction, as clubfoot and harelip. Early treatment of children with poliomyelitis is well known to prevent much crippling, prolonged treatment of the child injured at birth will restore many to useful existence, skilled and early treatment of congenital deformities and injuries due to accidents are essential to prevent deformity.

In northern parts of the country about 1 per cent of all school children suffer from rheumatic heart disease, 40 per cent of heart disease in adults is due to rheumatic disease starting in youth. In the South the disease is apparently less frequent, only 20 per cent of all heart disease in Virginia being due to rheumatic disease, in the far south the disease

is thought to be rare. It is known, however, that appropriate treatment of children with rheumatic disease will restore 60 per cent to normal life, 15 per cent to a life of restricted activity. The treatment, however, is long and often requires care in hospital or convalescent home at repeated intervals over a period of several years.

In apparently well children, malnutrition, and defects of vision of hearing of the lymphoid tissues of nose and throat, and of the teeth, are relatively frequent, many of these defects are remediable, and when remedied save the child from further illness or from maladjustments to their environment.

In one nation-wide survey in which dental defects were included, it was found that for every 1,000 children entering school there were approximately 1,300 defects that needed dental attention.

Inadequate public health and medical services prevent the improvement in child health which may be predicated on the basis of past accomplishments. The nature of the inadequacy is further indicated by the following facts:

Forty-two per cent of the children in rural areas having no organized health departments receive none of the services designed to control communicable disease on a community basis.

About one-third of sixty-two cities surveyed in 1936 were below standard practice in the control of measles, scarlet fever, whooping cough and diphtheria through medical and nursing supervision for the purpose of quarantine and education in aseptic care.

In two-thirds of these cities less than one-half of the preschool population had received diphtheria immunization as of 1936.

In 1936, 71 per cent of our cities with a population under 10,000 exercised no sanitary control over their milk supplies. In one of these cities in that year 500 cases of scarlet fever were traced to unpasteurized milk.

Seventy-five per cent of 120 health jurisdictions reporting the volume of health services for the preschool period failed to meet the standard required for adequate care of the preschool child.

Except in large cities resources for the correction of defects found in apparently well children and hospitalization as indicated for care are very inadequate.

Resources for medical care in hospitals, in convalescent homes or in their own homes for children who suffer from acute illness or from chronic or crippling conditions or are victims of accidents are still far from adequate, they are especially inadequate in rural areas and small cities and towns.

#### IV THE NEED FOR MORE COMPREHENSIVE PUBLIC HEALTH SERVICES

Apart from the special needs of maternity, infancy and childhood, the unmet needs of health service are large and diverse. They cover a wide range, they deal with all ages of life not already specially discussed, they apply in some instances to all economic levels and in others more specifically to the people of small means and to those without income. The services needed are equally diverse; in some cases they involve education in the hygiene of living, in other cases they require specific preventive services such as immunizations, diagnosis in the incipient stage of disease, isolation of an infective person in an institution equipped to give appropriate treatment, general medical care, or the special services of professional persons skilled in a particular branch of medicine.

**Tuberculosis**—Each year, 40,000 young adults between the ages of 15 and 45 die from the ravages of tuberculosis. The deaths among these young adults represent 57 per cent of all deaths from this cause. Each year, about 200,000 cases of the disease receive treatment in institutions, some 200,000 additional cases receive medical care of varying adequacy and are foci of infection to persons in contact with them. There is adequate evidence to justify the opinion of experts in this field that tuberculosis deaths can be reduced 50 per cent by health supervision of workers in occupations predisposing to the disease by detection of incipient cases, and by provision of adequate medical and institutional care in the early stages of the disease. The need for extension of these activities in the control of the disease is further indicated by the following facts:

In —\* states no activities in the field of industrial hygiene are carried on by the state health department and health supervision of workers by local official health agencies is relatively infrequent.

Almost one-half of the cities and rural counties reporting in the 1936 Health Conservation Contest sponsored by the U. S. Chamber of Commerce and the American Public Health Association failed to meet a

modest professional standard for clinic examinations required to diagnose incipient cases of tuberculosis.

In thirty-five of the ninety-four urban counties included in the National Health Survey no clinic facilities for the tuberculous were provided by either official or nonofficial health agencies.

In one-half of the cities reporting in the Health Conservation Contest in 1936 the proportion of resident cases hospitalized was below the standard set for the care of cases requiring institutional treatment.

A large body of evidence testifies that a large proportion of all cases are discovered too late in the course of the disease for effective treatment, and far too many reach tuberculosis sanatoriums when the disease has advanced too far for a hopeful outcome.

**The Venereal Diseases**—The venereal diseases constitute an important health problem with serious implications for many groups of the population. Congenital syphilis is an important and preventable cause of infant deaths and loss of fetal life, particularly among Negroes. Some 60,000 cases of congenital syphilis occur annually. The syphilitic involvements of the heart and blood vessels and of the nervous system result in almost 50,000 deaths annually in addition to those assigned specifically to syphilis, 80 per cent of which could be prevented by adequate treatment of the infection in its early stages. The increase in chronic nervous diseases is placing a severe burden on our institutional facilities and is creating enormous costs for our state and local governments. At least 10 per cent of first admissions to mental disease hospitals are attributable to syphilis in its manifestation as general paralysis; these cases can be eliminated by adequate early treatment of syphilitics.

The inadequacy of treatment facilities and practices is indicated by the following facts:

Only one-third of the syphilitics requiring treatment at a given time are now under treatment.

Less than one-half of sixty-nine cities surveyed in 1936 reached the standard for clinic registration required to provide an adequate volume of treatment.

Two-thirds of ninety-four health jurisdictions surveyed in 1936 had no clinics for the treatment of venereal disease under official or nonofficial control.

**Pneumonia**—An average of 96,500 deaths from pneumonia occurred annually in the period 1930-1935, as a cause of death, pneumonia is exceeded in importance only by the diseases of the heart, blood vessels, and kidneys, and by cancer. Each year, pneumonia disables nearly 600,000 persons. The death rate from this cause is highest among infants and children of the preschool ages, and among persons in late middle and old age.

At least 85 per cent, or 500,000, of the pneumonia cases occurring annually are caused by the pneumococcus. Anti-pneumococcus serum has been developed for the specific treatment of over one-half of these cases. There are encouraging evidences that the case fatality of 55 per cent of the cases of lobar pneumonia can probably be reduced by so much as one-half through the skilful use of serum treatment.

Pneumonia mortality and disability is excessive among workers exposed to marked changes in temperature, inclement weather, poor ventilation and a dusty atmosphere. Health supervision of the worker and his environment is an effective measure in reducing sickness and deaths due to this cause.

The inadequacy of clinic and nursing supervision of infants and preschool children on a community basis has been noted, such measures are important in the prevention of pneumonia in the ages in which mortality is highest. Present activities in the field of industrial hygiene, in common with other preventive services for adults, are generally inadequate. The status of pneumonia treatment on a community basis is indicated by the following facts:

Forty-four states have no pneumonia control programs. In sixteen states no main or branch laboratories of the state health department are equipped for the typing of pneumococci.

Ninety per cent of the specimens typed in 1936 by health department laboratories were typed in three states which have pneumonia control programs despite the fact that typing is essential for efficient serum treatment.

Less than one-half of the ninety-three cities of 100,000 population and over made pneumonia typings in their health department laboratories in 1936.

Seventy-eight per cent of all specimens typed in 1936 were typed by seventeen cities in the four states which have pneumonia control programs.

**Malaria**—The importance of malaria as a regional public health problem is indicated by the fact that 97 per cent of the

\* In the preliminary report received this figure was not supplied.



deaths from this cause in 1934 occurred in 14 Southern states. In the country as a whole, the average death rate from this cause is relatively low, great progress has been made in its control since the discovery of the method of its transmission by the mosquito. In certain Southern states, however, malaria still remains a leading cause of death, and it has shown little tendency to decrease in the past decade. The disability resulting from malaria is a serious handicap to workers in the rural areas of the South where the disease is endemic. Effective control measures include education, the detection and treatment of malaria carriers, location of the focus of infection and its elimination by drainage, the use of larvicides, and the prevention of "man-made" hazards, application of well established methods has greatly reduced the malaria problem in areas in which they have been fully developed. The malaria control program in the South has been notably advanced in recent years through drainage projects of the state health departments carried on in cooperation with the Works Progress Administration and the Public Health Service. Such work should be extended, but much remains to be done through epidemiologic surveys, routine inspection of malarious regions and public health education, services which can be provided by an adequately staffed county health department. Yet —\* per cent of the rural population in the eleven Southern states in which malaria constitutes a major public health program have no organized local health services.

*The Chronic Diseases of Middle and Old Age*—The continued aging of the population which is forecast for the near future will contribute to the upward trend of the death rate from the diseases especially severe in middle and old age—heart disease, nephritis, cancer, and diabetes. Only a concerted attack on these diseases as recognized problems of public health importance can hope to bring any reduction in the deaths and disability due to these causes. The results of the National Health Survey indicate that chronic disease alone accounts for six of the ten days of incapacity from serious disabling illness experienced by the average person in a year. The long duration of the average case of chronic disease and the specialized requirements for diagnosis and treatment combine to make illness of this type expensive. To persons in low and dependent income groups the assumption of such costs presents a serious burden if these costs are to be carried by individuals without such aid from public funds as has been provided for the treatment of the tuberculous and the mentally diseased.

*Cancer*—Control of cancer is one of the most urgent needs in a chronic disease program. Cancer was responsible for 140,000 deaths in 1935 or over 10 per cent of all deaths. It is estimated that there are 400,000 living persons suffering from cancer in the United States today. With mortality rates at their present level, it is probable that one person out of every eight who reaches the age of 45 years will ultimately die of cancer. And yet leading authorities have estimated that at least one-sixth of the annual deaths from this disease might be prevented if all cases of cancer were diagnosed early and treated promptly and adequately. There is, therefore, a three-fold public health need: (1) the establishment of adequate diagnostic centers, (2) the education of the public in the supreme importance of early diagnosis and treatment, and (3) the provision of treatment and hospitalization for the large majority of the population who cannot pay for the high costs of these specialized and expensive services.

*Diabetes*—There were 28,000 deaths in 1935 from diabetes. The number of diabetics in the United States is estimated to be from 400,000 to 500,000. The case fatality can be greatly reduced and longevity extended. Since the introduction of insulin therapy in 1922 death rates from diabetes in individuals under 50 have shown a marked decline. The experience of one of the larger diabetic clinics has demonstrated that the mortality from this cause can be cut for every age the range of reduction having been from 90 per cent or more for young diabetics (under 20) to 37 per cent for elderly diabetics (over 60).

*Diseases of the Heart, Blood Vessels and Kidneys*—This group of diseases takes an ever-increasing toll of lives. In 1935 deaths from these causes amounted to over 500,000—312,000 from heart diseases, 97,000 from apoplexy, 29,000 from arteriosclerosis and other circulatory diseases and 105,000 from diseases of the kidneys. While a large proportion of these deaths

are the inevitable result of the aging process, much can be done through prevention and treatment to avoid needless case to reduce suffering and premature disability and death, and to minimize the economic and emotional distress caused by these diseases.

Many of the deaths from these organic diseases are the outcome of earlier infections such as syphilis, acute rheumatic fever, the communicable diseases of childhood, or typhoid fever. Progressive communities have demonstrated that it is possible to establish facilities and procedures not only to help arrest infections but also to mitigate their after effects on vital tissues. For those cases that result from the process of senescence, there is the problem of providing facilities and care to keep incapacitation and discomfort at a minimum.

*Arthritis and Rheumatoid Disorders*—This group of diseases is rarely responsible for the death of its victims but it is responsible for an enormous burden of disability. It is estimated that about one and one-half million persons are disabled annually by arthritis, an additional number amounting to one and three quarter millions are disabled by neuralgia, neuritis, and lumbago. Among known means of reducing the disability due to chronic rheumatism are the removal of foci of infection such as diseased tonsils and teeth, the treatment of gonorrheal infections, dietary supervision, specialized therapies, and surgery in some of the severe cases of arthritis. It has been stated recently on good authority that careful and prolonged treatment resulted in recovery or definite improvement in 90 per cent of the cases in several large groups of patients. The hope of coping with the problem lies in a coordinated program of research and in provisions which would make adequate preventive, dental, medical, and institutional services available.

*Mental Disease and Deficiency*—An estimated total of half a million persons in this country are on the books of hospitals for mental disease. Some 100,000 new patients are admitted to these institutions annually, their average institutional residence is three years. These cases represent only the more severe organic or functional psychoses, the number of persons at large suffering from the milder forms of psychoneurosis cannot be estimated. Approximately 75,000 persons are in institutions for the feeble-minded and epileptic, it is estimated that the number of this mentally deficient group outside of institutions totals some 900,000 persons. The enumeration of the mentally ill extends far beyond mental disorders of these types. It embraces a variable proportion of behavior problems now included under the headings of dependency, delinquency and crime, and an additional group representing the outcome of faulty habits and misunderstandings in dealing with environmental relationships.

The mentally diseased and defective demand more than twice the volume of hospital and institutional care required by all other diseases combined. All but 2 per cent of patients in hospitals for mental diseases enumerated in the federal census of 1934 were in public institutions, approximately \$150,000,000 of public funds—over one fourth of all governmental expenditures for health and medical services—are expended annually in their operation and maintenance. The average annual cost of all services required for the diagnosis and treatment of a case of mental disease has been estimated at \$500, between two and four times as high as other notably "high cost" illnesses such as cancer, syphilis, diseases of the heart and kidneys, and chronic rheumatism. In addition to the costs of diagnosis and care, mental disease and deficiency constitute a major source of economic loss due to partial or complete loss of earning capacity. Economic considerations alone demand that a national health program include adequate provision for measures directed toward the prevention, amelioration and treatment of adverse mental states.

In 1933, 15 per cent and, in 1934, 16 per cent of all admissions of patients with psychoses to State hospitals were discharged as recovered. An increase in the proportion of recovery may be expected with provision for a more uniform distribution of public facilities through grants-in-aid for the intensive treatment of mental disease in the first year of institutional residence, the crucial time when recovery may be expected. This involves not only hospital facilities but facilities in terms of maintenance and professional and technical personnel trained in modern psychiatric techniques. Extension of psychiatric teaching facilities

connection with hospitals is necessary to provide uniformity in the training of such personnel, an indirect benefit of such a measure is the training of physicians who are to engage in general practice to recognize the danger signals incident to the development of mental illness and the application of preventive and early curative measures. Consultant service should be made available to state hospitals for the instruction of physicians in the newer techniques for the treatment of neurosyphilis and dementia praecox.

Prevention, arrest or cure of certain of the organic psychoses may be achieved through specific public health services, education, and use of modern therapeutic methods. The prevention of general paresis may be accomplished by early treatment of syphilis, which impedes the extension of this infection to the nervous system. Proper treatment of neurosyphilis is effective in curing, or arresting the development of the disease. The traumatic psychoses which have been increasing as a result of accidents arising in connection with growth in automotive transportation, can be reduced by extension of the educational program of accident prevention. Specific measures for the prevention of the functional psychoses—dementia praecox, the manic depressive states, and the psychoneuroses—have yet to be discovered but detection of premonitory symptoms of these diseases revealed in childhood hold promise in some degree for their prevention, and a definition of their cause. Early diagnosis of these disorders demands adequate clinic facilities and personnel trained to recognize the signs of mental illness.

The needs of the group of feeble-minded can be met only to the extent to which they are identified. Systematic registration of the feeble-minded, particularly those below and above school age, is of fundamental importance in planning for their supervision. Institutional care is required for a large proportion of the feeble-minded, present facilities are totally inadequate to meet the need. Finally, it is necessary that trained personnel be provided for the supervision of feeble-minded and epileptics on parole from institutions.

For the adjustment of abnormalities in behavior the child guidance clinic, serving the period of childhood and the mental hygiene, or psychiatric clinics for adults offer the facilities essential in determining, and modifying, the causes of behavior problems. The child guidance clinic is essentially a development of the past decade, it still remains chiefly an urban facility. A coordinated program of mental hygiene demands extension of the facilities provided by such clinics to small cities, and to rural areas.

Finally, the fundamental approach to the problem of mental hygiene demands the development in all State governments, of a department, a division, or a special agency for the effectual fulfillment of the needs of the mentally ill of the general population, under medical leadership, competent to formulate and coordinate a balanced program.

The inadequacy of the present program for the prevention, treatment and supervision of the mentally diseased and deficient is indicated by the following facts:

Only five states have a department or division of mental hygiene under medical direction responsible for the statewide coordination of the program. In seven of the nine years between 1926 and 1934 the average daily resident patient population of the state hospitals for mental disease was over 10 per cent in excess of the normal capacity of the hospitals. The excess of state hospital patient population over capacity existed in thirty-five states in 1933 and in thirty-eight states in 1934. The census of state mental hospitals conducted by the American Medical Association in 1936 indicated that one third of 228 hospitals reporting showed an excess of 15 per cent or more over normal capacity.

Present institutional facilities for the feeble-minded and epileptics accommodate approximately one fourth of this group or the mentally deficient requiring institutional care.

Full time clinical service for child guidance was provided in only twenty-seven of the largest cities of the country in 1934. This survey indicated that the child guidance movement was chiefly restricted to large urban centers. Services in cities with a population around 100,000 being fragmentary and almost nonexistent in small cities and rural areas.

**Industrial Hazards**—The type of occupation and the nature of the working environment are important factors in determining the health of the worker. Among the numerous hazards of occupation may be noted abnormalities of temperature and humidity, dust, infections, poisons and unsafe conditions or practices associated with the operation of machinery. The effect of these hazards may appear in an increased incidence of dis-

eases incident in both the industrial and nonindustrial population, among which tuberculosis and other respiratory diseases may be noted. The more specific hazards encountered solely in the working environment give rise to certain diseases designated as occupational, including such diseases as lead poisoning among workers in storage battery plants and potteries, the various miners' maladies and the pneumoconioses of workers exposed to a dusty atmosphere. The predisposition of the pneumoconioses to the development of respiratory tuberculosis, and the large number of industries in which the dust hazard exists, make this group of major importance among the occupational diseases.

At the date of the federal census of 1930, approximately forty-nine million persons in this country were gainfully employed, ten and three-fourths million of these workers were women. Manufacturing, mechanical and mineral industries accounted for nearly fifteen million workers, including slightly under two million women. The concerted effort of state and local governments is necessary if the health and safety of this large group of workers is to be maintained. At present, only twenty-four states provide supervision in the field of industrial hygiene through divisions established in state departments of health or labor, local activities in this field are carried on by only four cities. Extension of these necessary services requires additional personnel trained in industrial hygiene and sanitation.

#### V INCOME AND HEALTH NEEDS

In a representative sample of the urban population studied in the National Health Survey, 40 per cent of persons were found to be members of families with incomes of less than \$1,000, 65 per cent of families with incomes under \$1,500 and 80 per cent of families with incomes of less than \$2,000. About one half of the group with income under \$1,000 was in receipt of relief at some time during 1935. These figures are fundamental to any consideration of national health because they are basic to any contemplation of capacity to purchase not only food, shelter and clothing, but also medical care.

Rich and poor alike have benefited by the progress of public health and the medical sciences. Application of the newer knowledge has reduced to the vanishing point some of the plagues that once killed tens of thousands, and has led to great advances on other fronts where the accomplishments have been significant though partial. However, much of this progress has little significance for a large part of our population—the people who have small means. Community-wide services are, of course, at their service. Special services for the poor and the indigent are at their command. But the services they must buy with funds out of pocket are, in substantial measure, out of their reach when sickness strikes.

Whether sickness brings poverty, or whether poverty brings sickness, is fractious. Either may be viewed as much a truth as does not exclude its obverse. What is utterly clear is the intimate correlation between poverty and high morbidity. The vaunted advances in national health to which we ourselves have directed attention have only limited significance for the poor. It is cause for grave concern and for action, that the poor of our large cities experience sickness and mortality rates as high today as were the gross rates of fifty years ago.

In Massachusetts (where a long series of death records is available) sixteen out of every 100 infants born alive in 1880 died during their first year, in that commonwealth today, the average loss is four deaths in every 100 infants born alive. Yet as recently as 1931, infants in Denver families with an annual income of less than \$500, died at the same rate as average Massachusetts infants in 1880 while among Denver families with incomes of \$3,000 or more there were only three infant deaths for each 100 live births. In Cleveland in 1928, infants in the poorer districts died at the rate of ten per hundred born alive, while infants in the better economic areas had a rate of five.

In 1930, the tuberculosis death rate for unskilled laborers in ten states for which occupational mortality could be computed, was seven times that of professional men. In the general population the death rate from this cause has been displaced from the leading cause of death to the rank of seventh place and this has been accompanied by a drastic reduction in the gross death rate. But among the industrial workers, among those exposed

to special employment hazards, among Negroes and among other special groups, the rates remain much higher than for the population at large. There is danger in the complacent consideration of averages.

Death rates tell us of the annual loss of human lives but we must keep in mind that death rates measure only a fraction of the toll which sickness exacts. For every death that occurs during a year there are many illnesses. Indeed, if we count only severe disabling illnesses (i. e., those lasting for one week or longer), for each death there are sixteen illnesses that mean

TABLE 1—Association of Sickness With Low Income

Family Income	Annual Days of Disability per Person
Under \$1,200	8.9
\$1,200-2,000	5.7
2,000-3,000	5.0
3,000 and over	3.8

TABLE 2—National Bill for Health and Medical Services

	1929	1936
Total expenditures	\$3,660,000,000	\$3,210,000,000
Patients	2,490,000,000	2,460,000,000
Governments	510,000,000	520,000,000
Philanthropy	180,000,000	60,000,000
Industry	80,000,000	70,000,000

loss of work for the family bread-winner, absence from school of the school child, or inability of the housewife to go about her normal duties.

The association of sickness with low income is illustrated by the figures in table 1, taken from a survey made among representative families in many communities of the United States during the years 1928-1931.

In the winter of 1935-1936, the Public Health Service canvassed three-quarters of a million families in eighty-four urban communities, and obtained information on illness and medical care in relation to family income and relief status. Preliminary results for 2,308,600 persons in eighty-one of these surveyed communities have brought out some pertinent facts. Disabling illness in the relief population occurred at an annual rate 47 per cent higher for acute illness and 87 per cent higher for chronic illness than the corresponding rate for families with incomes of \$3,000 and over. The annual days of disability per capita in the relief-group was found to be three times as great as among upper income families, the nonrelief population with an income under \$1,000 showed an amount of disability over twice that of the highest income group. One in every twenty family heads in the relief population was unable to work because of chronic disability, as contrasted with only one in 250 heads of families with incomes of \$3,000 and over. Children of relief families experienced 30 per cent greater loss of time from school and usual activities because of illness than did children in families in moderate and comfortable circumstances.

Too often, the final outcome of illness is unemployment and dependency as shown in the following recent reports:

In New Jersey in 1934 one eighth of relief families had no member available for employment and the persons of gainfully occupied ages in 61 per cent of these families were unemployable because of illness or injuries.

In Dayton in 1934 the disability rate among relief persons was three times as great as among those not on relief.

In San Francisco in 1934 43 per cent of persons certified for work relief had impairments judged by physicians as a handicap in competing with others for jobs in private industry.

In Baltimore in 1937 40 per cent of the unemployable cases were considered such because of chronic illness.

About 16 per cent of all persons accepted by the state for old age assistance in 1937 under the national Social Security Act program were either bedridden or physically unable to care for themselves.

Of families receiving aid for dependent children all health on the part of either or both parents was recorded as a cause of need in 13 per cent of the cases in Kansas in March 1935 and 39 per cent of the cases in Maryland receiving such aid in September 1936.

Evidence on the association of sickness and poverty could be enumerated at great length. Perhaps these few citations will

suffice. Every substantial study of sickness in the population, whether in urban or in rural communities, serves only to furnish additional proofs. And every careful inquiry, directed to the point, shows clearly that "environmental" factors are at least as certainly responsible as are "genetic" factors. Not the least of the "environmental" factors is economic status. Sickness rates are higher among the poor than among those who are in better economic circumstances. As a corollary, the poor need more health and sickness service than the well-to-do or the wealthy.

The poor have much sickness, sickness brings poverty. This circular relation brings antisocial results. The people who are involved in the vicious circle are trapped, they cannot raise themselves out of it by their bootstraps. Only society, which pays a heavy price for this continuing situation, can intervene and bring relief.

#### VI INCOME AND THE RECEIPT OF HEALTH SERVICE

The purchase of health services is still mainly a matter of private and individual action. Though government (federal, state and local) spends considerable sums, and though organized groups pay an important share of the nation's bill for sickness, the individual patient still carries the lion's share through out-of-pocket payments. This may be illustrated by the breakdown of the national bill for all kinds of health and medical services, taking 1929 as illustrative of a prosperous predepression year, and 1936 as the most recent year for which comprehensive estimates are available (table 2).

Although there are some important exceptions, medical care is, in the main, an "economic commodity" which is purchased and paid for directly by the individual who needs it. The fact that this "economic commodity" is chiefly a professional service does not alter the basic fact. It therefore results that the amount of medical care obtained by individuals differs with economic status, the well-to-do obtain more, the poor obtain less. This is so notwithstanding the fact that the poor have more sickness and more disability, and need more (not less) service. There are some notable exceptions to this generalization. In areas where extensive provision has been made for free hospital care for needy persons, the amount of hospital service received (per capita) by the poor is sometimes actually greater than the amount received by any except the very well-to-do. But this is only an exception proving the rule that the amount of medical care received (measured in number of services) varies with the person's ability to pay for it. For example, a survey made during 1928-1931 among representative

TABLE 3—Volume of Service in Twelve Months

Service	Services per Person in Families with Specified Income					
	Under \$1,200	\$1,200-2,000	\$2,000-3,000	\$3,000-5,000	\$5,000-10,000	\$10,000 and over
Physician services for sick persons	1.9	2.0	2.3	2.7	3.6	4.7
Days of general hospital care	0.9	0.7	0.8	0.6	0.8	1.2
Dental cases (for persons over 3 yrs. of age)	0.1	0.2	0.2	0.3	0.4	0.6
Health examinations	0.03	0.07	0.07	0.08	0.1	0.2
Immunizations	0.07	0.05	0.05	0.06	0.03	0.1
Lye examinations and prescriptions	0.02	0.02	0.04	0.04	0.03	0.2

family groups in 130 communities scattered among seventeen states and the District of Columbia, showed the volumes of service received during a twelve months period given in table 3.

Although there was more disabling sickness among the people in the low income groups than among those in the higher brackets, the proportion who went a year of life without professional care was more than three times as high among the poorest as among the wealthiest families. This is summarized in the figures given in table 4.

Without belaboring the point, a few facts may be cited from the recently completed National Health Inventory.

No physician care was received in 30 per cent of serious diseases among relief families and in 28 per cent of such illness among families just above the relief level as contrasted with a figure of 1 per cent of illnesses receiving no care by a physician among families with income of \$3,000 and more.

Only 1 per cent of disabling illnesses among relief families received bedside nursing care in the home, as compared with 12 per cent in families with incomes of \$3,000 and over.

The average child under 15 years of age in relief families received about one half the number of physicians services and about one twentieth the number of services from a private duty nurse that were received by children in families with incomes of \$3,000 and over.

Only 5 per cent of births were hospitalized among families on relief in Southern cities of less than 25,000 as compared with 90 per cent of births among families with incomes of \$3,000 and over.

Nearly 13 per cent of births among relief families in small Southern cities were unattended by a physician or midwife as compared with 100 per cent attendance by a physician either in hospital or home for the upper income class.

These findings are in accord with the facts revealed in numerous other surveys made in various parts of the country. Each study adds additional evidence that the receipt of medical care depends largely on income and that people of small means or none at all, though having the greatest need for care, receive the least service.

#### VII INCOME AND ABILITY TO PAY FOR HEALTH SERVICE

Although ignorance, indifference and other factors play a part, the main reason why persons in the lower income brackets do not receive proper medical care is that they are unable to pay for it. Surveys of family expenditures show that, by and large, families tend to spend, on the average, 4 to 5 per cent of income for medical care. The proportion of income spent for medical care is fairly constant whatever the income up to an annual family income of \$5,000, beyond which it tends to decline slightly. A survey showed that in 1928-1931 families with annual incomes under \$1,200 spent \$43 a year on the average for medical care, families with incomes between \$1,200 and \$2,000 spent \$62 a year on the average, those with incomes between \$2,000 and \$3,000 spent \$91, and families with incomes of \$3,000 to \$5,000 spent, on the average, \$134 a year.

The present expenditures of families in the lower income brackets may be compared with the cost of adequate medical care. A number of estimates have been made of the per capita per family cost of furnishing adequate medical care to a representative population group. Such estimates run from a minimum of \$100 a year for a family of four to more than double this amount. Even taking the lower figure, it is apparent that this cost is more than a sizable proportion of families can afford to spend for medical care. An examination of family budgets leads to the conclusion that families with incomes of \$1,000 cannot afford to spend as much as \$100 a year, on the average, for medical care. The same conclusion probably holds for families with annual incomes of \$1,500. Yet, even in 1929, about 12 million families in this country, or more than 42 per cent of all, had incomes of less than \$1,500.

Although reductions in the cost of providing medical care are possible, and although people, by education and skilful propaganda may be persuaded to divert a larger portion of income to the purchase of medical care, the fact, nevertheless, remains that a large proportion of the population—certainly one third and perhaps one half—is too poor to afford the full cost of adequate medical care on any basis. This proportion of the population cannot purchase adequate medical care without depriving themselves of things which, in the long run, are just as necessary for decent healthy living as medical care. The one third of the population which is ill nourished, ill housed, ill clothed is also badly cared for in sickness and for the same reason because income is too small.

The situation as regards the purchase of medical care, as thus outlined, is somewhat oversimplified by the fact that the analysis runs in terms of averages. In actuality, sickness comes to individual families in average amounts, as it were, only by chance. The individual family's need for medical care is uneven and unpredictable. In one year, little medical service or none whatsoever may be required, in another year, the family may suffer one or more severe illnesses among its members and medical service costing large amounts may be required. One example will suffice. In 1928-1931, a sample of urban families with incomes of \$1,200 to \$2,000 annually incurred medical costs in a year's period amounting to approximately \$75 each, on the average. However, of 1,000 families, 620 had medical expenses for the year of less than \$60, 300 incurred costs of from \$60 to \$200, and eighty had expenses running from \$200

to over \$1,000. Of the 1,000 families, twenty had medical bills ranging from \$400 to over \$1,000—bills which, if paid, would have absorbed from one third to one half or more of the family's entire income.

This situation has two results. One is that available income is not well harnessed to the purchase of medical care. The family spends its income from day to day and does not save against the day of serious sickness and large medical bills. As a consequence, many individuals who could pay for their medical care if they made regular provision therefor, either go without care when sickness comes or are forced to ask for charity. A second result of this situation is that families endeavoring to pay their own way are oftentimes confronted in severe ills with medical bills which they can pay only with hardship. The expense of proper medical treatment in certain serious illnesses has now become an economic hazard like unemployment or death against which the average family requires protection.

The burden of sickness costs is mitigated in some measure by the arrangements whereby fees are adjusted to ability to pay. But the sliding scale operates only in limited ways and more particularly for specialists' than for other services. Though free and part-pay services and facilities have been extensively developed—especially in the large cities, though physicians give generously of their services, though hospitals are extensively equipped to care for the poor without direct charge to the patients and to give service at part pay, and though governments have greatly increased tax support for services furnished to the poor, the fact remains that large costs still fall on small purses. The poor still have fewer of their

TABLE 4—Persons Who Went Without Professional Care

Percentage of Individuals in Each Family Income Group Who Received No Medical Dental or Eye Care During a Year	
Family Income	Per Cent
Under \$1,200	47
\$1,200-2,000	42
2,000-3,000	37
3,000-5,000	33
5,000-10,000	24
10,000 and over	14

serious illnesses professionally attended and they purchase less adequate services than the well-to-do. The result is all the more serious because the poor have more sickness and more disability and need more—not less—services.

All evidence available to the Committee indicates that the problems raised by sickness costs present two clear-cut needs. 1 For people with incomes, ordinarily self sustaining in respect to other essentials of living (food, shelter and clothing), health and sickness services must be made more extensively available through measures that will lighten the burdens of sickness costs. This requires appropriate arrangements to minimize the impact of these costs on individual families through distribution of the costs among groups of people and over periods of time. To what extent the result shall be attained through more extensive use of tax support and to what extent through social insurance, or through a combination of both, is not at issue. Each procedure is applicable to parts of the problem, and each may be more appropriate than the other for particular groups in the population and for particular areas. 2 Larger financial support is needed for services to be furnished to people who are without income and to those other persons, otherwise able to maintain themselves, who are unable to obtain necessary care through their own resources.

Finally, it may be noted that what has been said as to the impact of sickness service costs is equally applicable, in general, to the impact of wage loss suffered because of the disability or permanent incapacity of the breadwinner. Disability wage loss amounts, in the aggregate, to something like 25 per cent of income. But it occurs among families variously in small and in large amounts. Disabling sickness hangs as an ever-present threat over the wage earner. He cannot budget individually against this risk. Provision through social insurance, or through systematic public assistance, or through both devices, is urgently needed to bring security of income against this common risk which threatens people of small and precarious earnings.

## VIII PERSONNEL AND FACILITIES FOR HEALTH SERVICE

An effective system of modern health service is impossible without an adequate professional personnel and institutional equipment. This implies a sufficient number of competent persons, effectively trained and experienced, a sufficient number of suitable hospitals, sanatoriums and other institutions, and an appropriate geographical distribution of both personnel and institutions. All things considered, it is probably that the most acute need in the United States is for more effective distribution, recognizing that this involves fundamental economic considerations.

Ineffective distribution and, in certain areas, more or less complete lack of hospital facilities and of medical and public health personnel account in part for excess in mortality and sickness from certain causes. The supply of physicians and private duty nurses, if adequately distributed, appears to be approximately sufficient to meet the current effective demand for service. Public health nursing, however, suffers from an undersupply of personnel. The number of dentists is determined today by the economic capacity of the public to pay for dental service through current methods of payment; the number is grossly less than would be required to meet the true need for dental services. Hospital facilities are insufficient to meet the full need for institutional and outpatient care in many areas.

**Physicians**—There are 165,000 physicians in the United States today, or a ratio of 128 per hundred thousand of the population. These would be approximately sufficient in number to supply the medical needs of the population if they were better distributed in relation to the need for service and if their potential services were being effectively or fully utilized. Young well trained men turn to urban centers to begin practice where professional and economic opportunities are greatest because of hospital facilities and higher average income of the people, despite the fact that many of these centers already have an adequate, or more than adequate, number of physicians. Many rural areas, small cities, and whole states are undersupplied with physicians. More recognition of the uneven distribution of practitioners will not solve the problem; practice in the underprivileged area must be made attractive from both a professional and economic viewpoint before the young physician can be expected to settle in these areas where his services are most acutely needed.

**Nurses**—The supply of graduate and other private nurses today is probably more than sufficient to meet the needs of the country. However, as in the case of physicians, there is a concentration of nurses in urban localities, and in these communities we have the paradox of unoccupied nurses needing work and patients unable to receive needed care because of inability to pay for it.

In the special field of public health nursing there is a definite undersupply of personnel. The accepted professional standard of adequacy would require one public health nurse to each 2,000 of the population. On this basis, we should have 65,000 instead of the 18,000 actually available on Jan. 1, 1937, or more than three times the present supply. In rural areas there is, on the average one nurse for every 11,000 population and in cities one nurse for every 5,000 population. In some states, one nurse must (if she can!) serve as many as 40,000 persons. Public health nurses are particularly needed for maternal and child care and it is clearly not possible for good prenatal care to be given by public health nurses if they are required to serve too extensive an area or too large a population. It would appear that at least three or four times as many public health nurses as are now available in rural areas are needed and at least twice as many in cities, if satisfactory maternal and child health service is to be rendered. There is evident here a dual problem—the training of personnel, and the provision of organization and funds for their effective employment.

**Dentists**—There are at present about 71,000 dentists in the United States or an average of 58 per hundred thousand of the population. Estimates of the need for adequate dental care for all our population indicate that the number of dentists could be doubled without reaching a figure in excess of the true need. As in the case of physicians and nurses, the number of dentists available is particularly inadequate in rural locali-

ties, small cities, and other areas where income is low. Having regard to the enormous accumulated neglect in dental care among adults, there is a tendency to especially direct such funds as are available for dental care toward preventive and other dentistry among children.

**Hospitals**—Each year finds the hospital filling a place of increasing importance in the maintenance of the nation's health. At one time, only the person near death went to a hospital; today the sick go there to receive care and to be cured, tomorrow well persons will seek the hospital for the prevention of illness and disability. The technology of modern health service requires increasing use of the clinic and outpatient department. The facilities must be adequate for the care of the bed patient, the ambulatory sick person, the patient in the early stages of disease, and the person in need of preventive care.

The increasing importance of the hospital in our national health services is the result of a variety of factors. In urban centers, home care of the sick is increasingly difficult in the crowded dwellings of the majority of the population. In rural areas, physicians can increase their efficiency and effectiveness tremendously if a hospital is available. Here the hospital serves a larger purpose than the treatment of the sick in its bed; it becomes the center for the health services of the community and influences the quality of care in the doctor's office and in the patient's home. Furthermore, the pattern of illness is changing as the proportion of older persons in the population increases. The illness of adult life—cancer, diabetes, heart and circulatory diseases, kidney diseases—are not subject to the mass methods of environmental control; they require attention to the individual through the services of physician, dentist, nurse and technician. With increase in the complexity of diagnostic and therapeutic procedures, care can often be given best in a hospital with those modern facilities for diagnosis and treatment which the private physician cannot maintain for himself.

Although the hospital facilities of some communities—especially of some large cities—exceed current effective demand for service, existing institutions are grossly inadequate to meet the needs of the population in many parts of the country. Such inadequacies are especially important and severe in rural and in economically underprivileged areas. Enlargement of hospital facilities is needed in many areas where there are some hospitals; construction of new institutions is required in many regions where none have been built. Without such institutions, well equipped and well staffed, many of the important services which twentieth century medicine offers to the public are impossible of attainment. Furthermore there is growing need for other local facilities equipped to serve as centers for diagnostic and preventive services where organized health agencies may operate in close correlation with medical and related practitioners.

Professional standards of adequacy indicate a need for general hospital facilities in the ratio of 46 beds per thousand persons, *neuronic* and *mental* hospital facilities in the ratio of 56 beds per thousand persons and *tuberculosis* hospital facilities in the ratio of two beds per annual death (about 11 beds per thousand persons at the present time). In this country today over two thirds of the states fall below these standards in general hospital facilities; nine tenths are below the standard for mental hospital and three fourths of the states fall below the standard for tuberculosis hospitals. A total of 31,000,000 persons live in areas with less than two general hospital beds per thousand persons and 80,000,000 persons live in areas with less than four beds per thousand persons. Nearly 1,300 (42 per cent) of the counties in the United States have no registered general hospitals. Being largely rural or sparsely settled these counties include only 15 per cent of the population. Nevertheless this means that there are 18,000,000 persons who are living in counties with no local hospital facilities. Special surveys would be required to determine which of these counties are adequately served by hospitals in adjacent counties and which need additional local facilities.

Capital investment in hospital construction diminished from a figure of \$200,000,000 annually in the period 1923-1925 to about \$50,000,000 in the period 1932-1936 with a large part of the relatively limited construction in the latter period due to the PWA program. The resulting accumulated deficit make imperative the stimulation of new construction.

Today, the United States has about 1,100,000 beds in general and special, mental, and tuberculosis hospitals, by professional standards of good medical care there will be needed by the end of the next decade about 1,500,000. This means a present deficiency of about 400,000 beds. This would include the construction of at least 500 hospitals of thirty to sixty bed capacity in rural and sparsely settled regions which have inadequate hospital facilities.

In addition, health and diagnostic centers are greatly needed in rural areas where they may serve as centers for the local health department staff, local physicians, visiting nurse services, maternal and child welfare staff, basic laboratory and other diagnostic services, emergency beds, etc. It may be conservatively estimated that about 500 such centers might properly and effectively be built in areas which are without local hospitals but, being adjacent to areas which have local hospitals, can have their acute needs met by these centers.

Furthermore, there is increasing need for the construction of hospitals for patients with chronic disease. Such hospitals differ from general hospitals in that they must offer facilities for domiciliary care as well as facilities for diagnosis and treatment, the duration of the average chronic case is many times that of the acute case, and for a greater part of his institutionalization the chronic-disease patient may need only nursing or custodial care. It is estimated that this country may eventually need as many as 200 beds per hundred thousand of the population for this purpose. With our present population, this would mean an additional 250,000 beds. In addition, there is need for about 100,000 beds in convalescent hospitals.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SPENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### CALIFORNIA

**Tristate Conference in San Francisco**—Representatives of the state medical associations of Washington and Oregon will meet in San Francisco, February 27, with the California Medical Association to discuss problems that are of mutual interest and to define policies and attitude as well as to direct influences to guide the people and legislators of the three states in matters pertaining to medical care and the care of those who are the wards of government.

**Society News**—The San Francisco County Medical Society was addressed February 8 by Drs Leonid S. Cherney and Margaret Schulze on "Justifiable Error in the Diagnosis of Acute Appendicitis" and "Surgical Aspects of Ruptured Graafian Follicle and Corpus Luteum Cysts." Dr Alfred Bielschowsky, Hanover, N. H., addressed the section on eye, ear, nose and throat at a special meeting January 31 on "Aniseikonia."—The Los Angeles Obstetrical and Gynecological Society was addressed February 8 by Drs Kenneth S. Davis on "Diagnosis of Placenta Praevia by X-Ray," Henry M. Rooney, "The History of Analgesia in Obstetrics," and Philip A. Reynolds and Raymond D. McBurney "Management of the Parturient Woman Under Analgesia."—Dr Walter Freeman, Washington, D. C., discussed "Psychosurgery" before the Los Angeles Society of Neurology February 23.—Among others Dr Albert G. Bower addressed the Los Angeles Surgical Society February 11 on sulfanilamide.

### DISTRICT OF COLUMBIA

**Health Survey**—At the request of the commissioners of the District, the U. S. Public Health Service recently launched a survey of Washington's health problems. Asst. Surg. Gen. Robert Olesen will direct the survey, in which ten or more service experts already located in the city will participate. It is planned to bring in other personnel from the field to conduct a special study of the tuberculosis problem. Galinger Municipal Hospital and other hospitals having contractual relations with the department will be investigated. It was reported.

**Society News**—Dr Arthur C. Christie addressed the Washington Medical and Surgical Society January 24 on "What Can the Doctor Do About the Increasing Socialization of Medicine?" and Dr Edgar Leonard Goodman, "Recent Advances in Surgery of the Eye."—The Medical Society of the District of Columbia was addressed February 23 by Drs Frederick A. Reuter and Joseph F. Geisinger, Richmond, Va., on "Routine Examination of the External Genitals" and "Unsuspected Massive Pathology in the Upper Urinary Tract." Dr George R. Minot, Boston, addressed the society February 16, under the auspices of the section on internal medicine, on "Anemia—Etiology, Diagnosis and Treatment." The section on neurology and psychiatry sponsored talks February 9 by Drs Elias L. Stern, New York, on "Clinical Use of Vitamin B and Absolute Alcohol Intraspinally. Some Experimental Observations," and Winfred Overholser, Boston, "The Mental Hospital of Yesterday and Today."—Dr Frederick Parker Gay, New York, discussed "Medical Logic" before the Academy of Medicine of Washington at its meeting January 29. Carl Voegtlin, Ph.D., was recently elected president of the society.

### ILLINOIS

**Society News**—At a joint meeting of the Madison county medical and bar associations in Alton February 10, Dr Rollo K. Packard, Chicago, president of the state medical society, and Mr John F. Voigt, Chicago, president of the state bar association, spoke on the Constitution.—Dr Harry Culver, Chicago, discussed "Surgical Treatment of Bladder Neck Construction" and "The Newer Urinary Antiseptics" before the Rock Island County Medical Society February 8. Dr William H. Myers, Coal Valley, spoke on "Technics Found Useful in Surgery of the Biliary Passages."—Dr Vancan V. Wood, St. Louis, discussed otolaryngology before a meeting of the Sangamon County Medical Society, Springfield, February 3, and Dr Gottfried Koehler, Springfield, gave a demonstration of the audiometer.

### Chicago

**Dr White to Speak**—Dr Paul Dudley White, assistant professor of medicine, Harvard Medical School, Boston, will address the North Side Branch of the Chicago Medical Society, March 3, at the Drake Hotel. His subject will be "Nature, Diagnosis and Treatment of Heart Disease."

**Dinner in Honor of Drs Ranson and Hertzler**—Dr Stephen Walter Ranson, professor of neurology Northwestern University Medical School, and Dr Arthur E. Hertzler, professor of surgery, University of Kansas School of Medicine, Kansas City, Kan., were guests of honor at an informal dinner, February 15, given by Theta of Phi Beta Phi. The dinner was held before the annual Stephen Walter Ranson Lecture, which was delivered by Dr Hertzler, his subject was "The Thyroid Heart."

**Society News**—At the second annual dinner of the Chicago Hospital Council at the Congress Hotel, January 18, the guest speakers were Drs Logan Clendening, professor of clinical medicine, University of Kansas School of Medicine, Nathaniel W. Faxon, medical director, Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary, Boston, and Mr David H. McAlpin Pyle, president of the United Hospital Fund, New York.—Dr Carolyn N. MacDonald discussed "Syphilis with Its Prenatal Influences" and Minnie S. Oboler Perlstein "Syphilis with Special Reference to Treatment" before the Chicago Council of Medical Women February 4.—A joint meeting of the Chicago Roentgen Society and the Chicago Tuberculosis Society was addressed by Drs John B. Barnwell, Ann Arbor, Mich., on "Roentgenologic Changes Seen in Patients with Tuberculous Tracheobronchitis" and William E. Anspach, "Transphrenic Infection in Children."

### INDIANA

**Indiana's Health in 1937**—The death rate in Indiana was 117 per thousand of population in 1937, as compared with 122 in 1936 according to the state medical journal. The birth rate was 16 in 1937 as against 15.5 in 1936. The infant mortality rate was 49.5 per thousand births as compared with 50.7 and the maternal mortality rate 3.4 against 4.5. The journal reported a reduction in the number of deaths due to most types of communicable diseases pointing out that this was significant since the winter flood occurred in 1937. A reduction was noted in accidental deaths from 3,653 in 1936 to 3,175 in 1937. Automobile fatalities totaled 1,434 as compared with 1,349 in 1936. There was also an increase in suicidal deaths, 590 in 1937 against 480 in 1936.



**Society News**—Dr Magnus P Urnes, Chicago, discussed "The Management of Occiput Posterior Position" before the Northeastern Indiana Academy of Medicine in Kendallville January 27.—A symposium on blindness with special reference to cause and prevention was presented February 15 before the Indianapolis Medical Society, speakers will include Drs Robert J Masters, Dunn Hamilton Row, Cyrus W Rutherford and Cecil P Clark. A symposium on gynecology was presented February 22 by Drs Ross C Ottinger, Dudley A Pfaff, John William Hofmann and Carl Habich. At a meeting February 1 Drs Herman G Morgan and Mason B Light spoke on "Respiratory Infections and Pneumonia from the Public Health Standpoint" and "Tracheobronchial Drainage in Pneumonia and Suppurative Pneumonitis" respectively.

### LOUISIANA

**Second Annual Graduate Assembly**—The second annual New Orleans Graduate Medical Assembly will be held in New Orleans at the Roosevelt Hotel, March 7-10. The speakers will include

- Dr Reginald Fitz Boston Progress in Diabetes
- Dr Harvey B Stone Baltimore Carcinoma of the Colon
- Dr Fred W Stewart New York Curability of Cancer and How It Can Be Improved
- Dr Richard P Strong, Boston Anemias Secondary to Parasitic Infection
- Dr Charles Mazer, Philadelphia Diagnosis and Treatment of Sterility
- Dr Frederick M Hodges Richmond Va Treatment of Inflammatory Diseases with X-Ray
- Dr Albert Graeme Mitchell, Cincinnati What I Don't Know About the Endocrines
- Dr Burrill B Crohn New York Distribution of Dysentery and Its Relation to Ulcerative Colitis
- Dr Frank R Spencer, Boulder Colo, Laryngeal Tuberculosis
- Dr Algernon B Reese, New York Intravenous Urography in Medicine
- Dr Temple S Fry, Philadelphia Head Trauma and Its Applications
- Dr William C Danforth Evanston Ill The Management of Posterior Occiput
- Dr Warren T Vaughan Richmond, Va Principles of Vaccine Therapy
- Dr Philip D Wilson New York Equalization of Leg Length
- Dr Arthur E Hertzler Halstead Kan Pathology and Treatment of Detergent Tumors
- Dr Udo J Wile, Ann Arbor The Treatment of Syphilis in Pregnancy
- Dr Norman F Miller Ann Arbor Woman at Forty
- Dr William E Lower Cleveland Infections at the Genito Urinary Tract

The program will be made up of lectures, clinical pathologic conferences and round table discussions. The session Thursday evening will be a joint meeting with the Orleans Parish Medical Society.

### MAINE

**Commonwealth Fund Sponsors Graduate Fellowships**—The Commonwealth Fund of New York is making available fellowships in medicine, pediatrics, obstetrics and office surgery to members of the Maine Medical Association, to be given at the Harvard Medical School, Courses for Graduates, 25 Shattuck Street, Boston. Fellowships are for one month. Physicians taking the course in medicine will be given preference for a second month of study when fellowships are available in succeeding years. The stipend is \$250 plus tuition and an allowance of \$25 for traveling expenses. Applicants must be graduates of grade A medical schools, members of the Maine Medical Association in good standing, must have been in practice at least five years and should preferably be under 45 years of age and must be residents of communities of less than 10,000 population. Application blanks may be obtained from the division of public health, Commonwealth Fund, 41 East Fifty-Seventh Street, New York, or from Dr Frederick R Carter, Augusta, secretary, Maine Medical Association, 22 Arsenal Street, Portland.

### MICHIGAN

**Physicians Needed in Hospitals**—Physicians interested in obtaining positions in Michigan state hospitals and institutions are invited to compete in an open examination March 19 by the Michigan Civil Service Department. Residence requirements have been waived and all qualified citizens of the United States are eligible. Examination centers will be established in Michigan and in cities throughout the United States wherever there are sufficient applicants. The examination is being given to establish an eligible register from which names will be certified to fill present vacancies in the state hospitals. It is open to physicians not over 35 years of age who have been graduated from a medical school of recognized standing, who have a license to practice in Michigan or a license from a state with a reciprocating license agreement, and who have had one year of rotating internship in an approved general hospital. The tentative salary for the positions has been set at \$180 per month with certain deductions for maintenance.

Full details of the nature of the work and the scope of the examination may be obtained from the Michigan Civil Service Department, 320 Olds Tower, Lansing. Applications must be placed in the mail so as to be postmarked by midnight March 7, to be accepted by the civil service department.

### MISSOURI

**Jackson County Transfers Executive Offices**—The Jackson County Medical Society recently moved its executive offices to a ten room suite, 610 Argyle Building, Kansas City. The new quarters include a reception room, executive secretary's office, the Medical Business Bureau, mailing room, filing room, executive council chambers, publication office, president's office, and a kitchen. According to Fred K Helsby, executive secretary of the society, the plan of serving food at the meetings has greatly improved attendance.

**Medicomilitary Symposium**—The annual spring medicomilitary symposium will be held in the Jackson County Medical Society Auditorium, Kansas City, March 28-29, under the auspices of the Kansas City Southwest Clinical Society. The program will cover a wide range of subjects and include symposiums on arthritis and genito urinary diseases. Dr John Albert Key, St Louis, will address the session Monday evening on "Treatment of Acute Osteomyelitis" and Lieut Comdr Lincoln Humphrey will show a sound motion picture on "The Modern Man-of-Warman" and discuss "Our First Line of Defense." The meeting Tuesday evening will be a joint one with the Jackson and Wyandotte county medical societies and speakers will be Drs Ovid O Meyer, Madison, Wis., on "Diagnosis and Management of Anemias in General Practice" and Logan Clendenning, Kansas City, "The Practice of Medicine in the United States."

### MONTANA

**New Unit for Crippled Children**—The Louis W Shodair Crippled Children's Hospital Unit of the Montana Children's Home and Hospital was dedicated at Helena January 20. The hospital will be devoted to the care of crippled children regardless of race, color or creed. It was made possible by a gift of \$100,000 from Louis W Shodair, a resident of Montana.

### NEBRASKA

**Speakers' Bureau**—The speakers' bureau of the Nebraska State Medical Association and the Nebraska State Public Health Department has opened an office in Omaha to supply speakers for medical societies and lay organizations. The bureau is now prepared to arrange programs for single meetings or for a year in advance, symposiums, graduate courses and radio talks by physicians. Dr Joseph D McCarthy is in charge.

**Society News**—Dr Alexis F Hartmann, St Louis, addressed the Omaha-Douglas County Medical Society, Omaha January 11, on "Therapeutic Uses of Sodium r-Lactate," and Dr Maurice E Grier, Omaha, on "Treatment of Benign Lesions of the Cervix."—Drs Elmer M Hansen and Everett E D Angle addressed the Lancaster County Medical Society, January 4, on "Experiences with Induction of Labor" and "Anomalies of the Lower Urinary Tract" respectively.

### NEW JERSEY

**Society News**—Dr Edward S Dillon, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, January 20, on diabetes.—Dr Jesse G M Bullowa, New York, addressed the Essex County Medical Society, Newark January 13, on "Management of the Pneumonias."—Dr Ambrose I Dowd, Newark, was elected president of the New Jersey Neuropsychiatric Association at a meeting in December and Dr Henry A Davidson, Newark, secretary.—Dr Henry Harold Gelfand, New York, addressed the Bergen County Medical Society, Hackensack, February 8 on "Diagnosis and Treatment of Hay Fever."

**Study of Supply of Physicians**—The Medical Society of New Jersey recently made a study of the supply of physicians in the state which showed that since 1929 the population increased 107 per cent and the number of physicians 278 per cent. The number of persons per physician decreased 13.3 per cent. For comparison the figures for the adjacent states of New York and Connecticut were analyzed. In New York the population increased 131 per cent, the number of physicians increased 177 per cent and the number of persons per physician decreased 8.6 between 1929 and 1936. Connecticut showed an even greater tendency to an oversupply of physicians the population decreased 07, while the number of physicians



increased 204 per cent and the population per physician decreased 169 per cent. The study was based on figures in the American Medical Directory for 1929, 1934 and 1936

## NEW YORK

**Society News**—Dr Henry T Chickering, New York, addressed the Medical Society of the County of Westchester, at the New York Hospital, Westchester Division, White Plains, February 15, on pneumonia.—Dr Perrin H Long, Baltimore, addressed the Medical Society of the County of Nassau, Mineola, January 25, on "Another Year of Sulfanilamide"

## New York City

**Personal**—Philip E Smith, Ph D, professor of anatomy, Columbia University College of Physicians and Surgeons, has been made a Knight of the French Legion of Honor.—Dr Bernard Sachs was honored with a dinner January 8 celebrating his eightieth birthday, which occurred January 2. The dinner was given by Mr John S Burke, president of the Altman and Friedsam Foundations, and the guests included trustees of the two foundations and representatives of various medical and civic organizations with which Dr Sachs has been associated. Dr Foster Kennedy was toastmaster.

**Blizzard Class Reunion**—Members of the group of physicians who graduated from Bellevue Hospital Medical College March 12, 1888, the night of New York's greatest blizzard, will hold a reunion at a dinner Saturday March 12 at the Hotel McAlpin. The reunion will be a memorial to Dr David Hunter McAlpin, who was for many years host to the class at its reunions. Dr McAlpin died Jan 20, 1934. Any member of the class who has not received a direct invitation is asked to write to the secretary, Dr S Adolphus Knopf, 16 West Ninety-Fifth Street. The price of the dinner will be \$2.50, which should be sent to Dr John Richard Kevin, 252 Gates Avenue, Brooklyn.

**Plan Health Museum**—Louis I Dublin, Ph D, vice president of the Metropolitan Life Insurance Company, has been elected acting chairman of a group incorporated to establish an American Museum of Health. The park commissioner has set aside space on Ward's Island, which is now being developed for recreation purposes. It is believed that the buildings of the Manhattan State Hospital, now being vacated, can be used temporarily for the exhibits, for which the health and medical exhibits at the New York World's Fair 1939 may be used as a nucleus. Other members of the group of incorporators are Drs George Baehr, representing the New York Academy of Medicine, David J Kaliski, chairman of the coordinating council of the five county medical societies in New York City, and John L Rice, health commissioner, and Mr Homer N Calver, director of health exhibits at the fair.

**Tuberculosis in High School Students**—The New York City Department of Health and the Board of Education recently announced plans for a survey of 20,000 high school students to determine the presence of tuberculosis. Students in all high schools in East and Central Harlem will be examined. Each student will have an x-ray examination of the chest in a search for infection with tuberculosis, as well as cardiac disturbances. The roentgenograms are to be paid for by the health department and about 100 nurses and other personnel have been supplied by WPA. If the sampling in this group yields significant information, the program may be extended, it was said. Results of the test will be used to map a comprehensive health program, directed toward placing children who show symptoms under the care of a physician. An effort will also be made to find the source of the infection and eliminate it.

**Hospital News**—Dr Angelo L. Soresi is giving a series of lectures at the International Medical Center Wednesday evenings on pathogenesis, diagnosis and medicosurgical treatment of diseases of the digestive organs.—Dr Franz M Groedel delivered one of the Louis Adler Lectures in Cardiology at the Manhattan General Hospital, January 31, on "Treatment of Angina Pectoris".—Dr Abraham P Matusow was recently elected president of the Metropolitan Hospital Alumni Association and Dr Solomon J Miller, secretary.—A new \$300,000 dispensary was opened at Greenpoint Hospital Brooklyn, January 20, with ceremonies at which the speakers were Mayor La Guardia, Dr Sigismund S Goldwater, commissioner of hospitals, Dr Charles H. Goodrich Brooklyn, president of the Medical Society of the State of New York, and Dr Thurston S Welton, Brooklyn, president of the hospital's medical board.

## OHIO

**New Officers of Medical Board**—Dr Floyd S Meck, Cleveland, was elected president of the Ohio State Medical Board at a meeting in Columbus in January. Dr Louis T Franklin, Chillicothe, was elected vice president and Dr Carlisle W Dewey, Conneaut, treasurer. Dr Herbert M Platter, Columbus, was reelected secretary.

**Regional Graduate Course**—The second series in the program of regional graduate lectures presented under the auspices of the Ohio State Medical Association is being given at Chillicothe as the center for Region B. The first series was given in northwestern Ohio alternately in Findlay and Defiance. The series consists of eight sessions, as follows:

February 3 Drs Roy W Scott Cleveland arteriosclerosis Robert E Barney Cleveland diagnosis and treatment of early syphilis  
February 17 Drs Marion A Blankenbom Cincinnati pneumonia Cecil Striker Cincinnati diabetes  
March 3 Drs John F Beachler Piqua intestinal obstruction James B Nelson Youngstown common lesions of the cervix  
March 17 Drs Edward A Wagner Cincinnati tuberculosis in infancy James G Kramer Akron prophylaxis and treatment of more common contagious diseases  
March 31 Drs Charles W Stone Cleveland common psychoses Edward J McCormick Toledo cancer of the breast  
April 14 Drs Walter W Brand Toledo antepartum and postpartum care Thomas P Shupe Cleveland infections of the urinary tract  
April 28 Drs Frances C Clifford Toledo angina pectoris Howard J Parkhurst Toledo fungous and pyogenic infections of the skin  
May 19 Drs Hiram B Weiss Cincinnati arthritis (medical aspects), Joseph A Freiberg Cincinnati arthritis (orthopedic aspects)

## OREGON

**Annual Course in Ophthalmology and Otolaryngology**—The Oregon Academy of Ophthalmology and Otolaryngology and the University of Oregon Medical School will present their third annual graduate course in ophthalmology and otolaryngology, April 3-9, in Portland. Drs Albert C Furstenberg, dean and professor of otolaryngology at the University of Michigan Medical School, Ann Arbor, and Sanford Gifford, professor of ophthalmology at Northwestern University Medical School, Chicago, will be the instructors. The course is primarily intended for physicians in special practice, but, since a number of general practitioners whose work necessitates some care of eye, ear, nose and throat conditions have found the study of value to them, the committee wishes it announced that subjects of practical interest to physicians in general practice will be given the first consideration this year. Copies of the program of the course may be obtained from Dr Paul Bailey, 929 Medical-Dental Building, Portland.

**Council Opposes Unionization of Professional Groups**—The council of the Oregon State Medical Society at a meeting in January adopted a statement of policy concerning attempts that have been made to organize established professional groups and groups of persons engaged in services supplementary to professional work into labor unions. Such efforts must be opposed, the statement says, in the interest of maintaining the freedom of action and initiative essential to carrying on and improving the standards of professional services. The statement points out that the principles and methods which may be legitimately employed by labor organizations are incompatible with the practice of a profession. Labor organizations have for their prime object the improvement of wages, hours and conditions of employment for their members, the medical profession has assumed the obligation of caring for the sick and injured, "without discrimination on account of racial, religious or other conditions of the kind, continuously and unflinchingly in peace, war, flood fire, pestilence, come what may." The statement continues "It must not put the compensation or convenience of its members before the public need. It would be unthinkable for the medical profession or any other group engaged in the healing arts to refuse to render the services it has undertaken to perform to go on strike and prevent others from taking up its work." The Oregon State Federation of Professional Societies has also adopted a resolution to the effect that affiliation of its members with trade unions or similar organizations is incompatible with the obligations of professional men and women and hence detrimental to the public welfare. The federation is made up of the state dental association, graduate nurses' association medical society pharmaceutical association, society of radiographers and veterinarians association.

## PENNSYLVANIA

**Hospital Appointments**—Dr Wendell J Stainsby, recently assistant professor of medicine at Cornell University Medical College New York, has been appointed director of the department of internal medicine at Geisinger Memorial Hospital, Danville.—Dr Raymond Joseph Garvey has been made direc-

tor of the Scranton Private Hospital, succeeding the late Dr Charles E Thompson Jr

**Society News**—Dr Leon H Collins Jr, Philadelphia, addressed the Northampton County Medical Society at the Country Club of Northampton County, February 18, on "Pneumonia and Its Control"—Dr Joseph A Hepp, Pittsburgh, addressed the Westmoreland County Medical Society at the Mountain View Hotel near Greensburg, February 15, on "Endocrine Mechanisms in Gynecology"

#### Philadelphia

**Society News**—Speakers before the Philadelphia Pediatric Society February 8 were Drs Mitchell I Rubin and Milton Rapoport on "The Hypertension of Acute Glomerulonephritis", Hubert W Hetherington, "Treatment of Pulmonary Tuberculosis in Infants and Children," and Charles F Church, "Diet and Resistance to Infection"—Dr Irving Graef, New York, among others, addressed the Pathological Society of Philadelphia February 10 on "Pneumonia in Infancy and Childhood—Studies Based on Whole Lung Sections"—The Philadelphia County Medical Society and its Woman's Auxiliary sponsored a public medical forum February 15 on the subject "You and Your Heart" with Dr William D Stroud and Miss Catherine R Roess, dietitian of Jefferson Hospital, as the speakers

#### WASHINGTON

**Puget Sound Surgical Meeting**—The annual meeting of the Puget Sound Surgical Society will be held in Seattle, March 11-12, with Dr Richard B Cattell, Boston, as the guest speaker. There will be a dinner at the Ramier Club Friday evening March 11, and clinics will be held at the King County Hospital Saturday March 12

#### WEST VIRGINIA

**Meeting on Industrial Medicine**—The annual midwinter meeting of the West Virginia Society of Industrial Physicians and Surgeons was held in Charleston February 8. Dr Henry H Kessler, Newark, N J, was the guest speaker, on "Problems in Rehabilitation of the Injured Employee." Dr Paul H Revercomb, Charleston, presented a paper on "Fat Embolism Complicating Fracture of the Long Bones," and there was a round table discussion on "When to Put the Injured Employee Back to Work"

**County Officers' Conference**—The annual conference of county medical society secretaries and presidents was held in Charleston at the headquarters of the West Virginia State Medical Association January 15. Subjects discussed included refresher courses, the new compulsory immunization law, group hospitalization in West Virginia, medical participation in the public assistance law and syphilis control in West Virginia. Dr Rosco G Leland, director of the bureau of medical economics, American Medical Association, Chicago, was the guest speaker, on "Socialistic Trends in Medicine"

**Society News**—Dr John H J Upham, Columbus, President of the American Medical Association, addressed the Ohio County Medical Society, Wheeling, January 14, on "Heart Diseases in Middle Life"—Dr Robert T Humphries, Clarksburg, addressed the Harrison County Medical Society in Clarksburg January 15 on "Differential Diagnosis and Treatment of Acute Arthritis"—Drs Archer A Wilson and Vernon L Peterson, Charleston, addressed the Logan County Medical Society, Logan, in January on "Head Injuries" and "X-Ray Findings of Lesions of the Stomach" respectively—Dr Harvey G Beck, Baltimore, addressed the Academy of Medicine of Parkersburg January 6 on "The Role of Carbon Monoxide in the Etiology of Myocardial Diseases"—Dr George M Lyon, Huntington, addressed the Raleigh County Medical Society, Beckley, January 20, on "Acute Respiratory Infections in Children"

#### WISCONSIN

**Personal**—Dr Paul F Doege, Marshfield, has been appointed medical editor of the *Wisconsin Medical Journal*—Dr Benjamin Lieberman has been appointed head of the school hygiene division of the Milwaukee department of health to succeed the late Dr George P Barth

**Society News**—Dr Royd R Sayers, U S Public Health Service, Washington D C, addressed the Medical Society of Milwaukee County, January 14, on "Poisons of Modern Industry: Their Recognition and Control" and Mr William P Yant, Pittsburgh, chemical engineer, "Carbon Monoxide Poisoning"

**The Bardeen Lecture**—Carl G Hartman, Ph D, professor of zoology, Carnegie Institution Laboratory of Embryology,

Johns Hopkins University School of Medicine, Baltimore delivered the Charles R Bardeen Memorial Lecture at the University of Wisconsin, Madison, February 15 under the auspices of the Phi Chi medical fraternity. Dr Hartman's subject was "Ovulation"

#### GENERAL

**U S Pharmacopeia Published in Spanish**—A Spanish edition of the U S Pharmacopeia, Eleventh Decennial Revision, has recently come from the press, according to an announcement from the revision committee. The volume of 695 pages was translated under the auspices of the Pan American Sanitary Bureau, Washington, D C, and is distributed by the Business Publishers International Corporation, 330 West Forty-Second Street, New York. This is the fourth edition of the pharmacopeia that has been translated into Spanish

**Grants by the Ella Sachs Plotz Foundation**—The fourteenth annual report of the Ella Sachs Plotz Foundation shows that twenty-six grants were made during 1937. Eighteen went to scientists outside the United States. During its fourteen years the foundation has made 308 grants to investigators in thirty-one foreign countries and the United States. Grants are usually less than \$500. Applications for grants for the year 1938-1939 must be in the hands of the executive committee before May 1. There are no formal application blanks, but letters asking for aid should state definitely the qualifications of the investigator, an accurate description of the proposed research, the size of the grant requested and the specific use of the money to be expended. It is desirable to include letters of recommendation from the directors of the laboratories in which the work is to be done. Applications should be sent to Dr Joseph C Aub, Collis P Huntington Memorial Hospital, 695 Huntington Avenue, Boston, Mass

**American Board of Ophthalmology**—Examination by the American Board of Ophthalmology during 1938 will be held in San Francisco June 13, Washington, D C, October 8 and Oklahoma City, November 15. Applications should be filed immediately. The required number of case reports must be filed at least sixty days prior to date of the examination. Application blanks may be obtained from the secretary, Dr John Green, 3720 Washington Avenue, St Louis. The board has recently established a "preparatory group" of prospective candidates for its certificates for the purpose of giving to such prospective candidates advice that will render them acceptable for examination and certification. Any graduate or under graduate of an approved medical school may apply for membership in this group. The fee for membership is \$10, but this amount will be deducted from the \$50 required of every candidate at the time of examination. During 1937 the board examined 180 candidates, of whom 117 passed, forty five were conditioned and six failed

**Southeastern Surgical Congress**—The ninth annual assembly of the Southeastern Surgical Congress will be held in Louisville, Ky, March 7-9, with headquarters at the Brown Hotel under the presidency of Dr Fred W Rankin, Lexington, Ky. Guest speakers will include

Dr William Wayne Babcock Philadelphia Operative Treatment of Vesicovaginal and Related Fistula  
Dr Arthur Hertzler Halstead Kan The Operating Room Diagnosis of Uterine Bleeding  
Dr Algernon B Reese New York Intra-Ocular Tumors  
Dr Willis D Gatch Indianapolis Observations on Wound Healing  
Dr George F Cahill New York Studies of the Adrenals by X Ray in the Adrenal Genital Syndrome  
Dr Charles Gordon Heyd New York Surgical Treatment of General Peritonitis by the Handley Operation  
Dr Reed M Nesbit Ann Arbor Mich Recent Advances in Technique of Transurethral Prostatectomy  
Dr George W Crile Cleveland Operative Treatment of Essential Hypertension  
Dr Joseph E J King New York Brain Abscess Into the Ventricle  
Dr Henry H Kessler Newark N J, Cineplastic Amputation  
Dr Philemon E Truesdale Fall River Mass Diaphragmatic Hernia—Its Varieties  
Dr Ambrose L Lockwood Toronto Ont The Surgical Dyspnea  
Dr Champ Lyons Boston Modern Methods in the Treatment of Surgical Infections

Dr Alton Ochsner, New Orleans, will deliver the C Jeff Miller Memorial Lecture Monday evening March 7 at a joint meeting with the Jefferson County Medical Society on "Thrombophlebitis." At this session Dr Rankin will deliver his presidential address on "Modern Trends in the Practice and Teaching of Surgery"

#### CORRECTION

**The Largest Surgically Removed Prostate**—In the third line of the fourth paragraph of Wadsten's article in THE JOURNAL February 12, page 509, the word "ureteral" should have been "urethral"

## Government Services

### Annual Report of Veterans' Administration

According to the annual report of the Veterans' Administration, there were 141,537 admissions of United States veterans to hospitals during the year ended June 30, 1937. Of the 192,603 patients hospitalized, 188,956 were veterans, representing an increase of about 11 per cent over 1936. More than 90 per cent of the admissions were on account of non-service connected disabilities. There were 142,814 veterans discharged after an average of 82.2 days in the hospital, 74.58 per cent of the total discharges or 106,506 persons remained until the completion of treatment. About 77 per cent of the veterans discharged during the year had been under treatment for general diseases, and 7 per cent for pulmonary tuberculosis.

Deaths in hospital totaled 10,051, or 7.04 per cent of the discharges, as compared with 8,465, or 6.7 per cent, in 1936. Of the total deaths, 6,353, or 63.21 per cent, occurred among patients under treatment for general conditions, 2,249, or 22.37 per cent, for pulmonary tuberculosis, and 1,449, or 14.42 per cent, for neuropsychiatric diseases. Considering the total number discharged after treatment for each type of disability during the year, 21.74 per cent of the pulmonary tuberculosis cases resulted in death, 5.8 per cent of the general, and 6.35 per cent of the neuropsychiatric. Of the 6,353 deaths among general patients, about 34 per cent were caused by diseases of the circulatory system, including organic heart disease, and about 30 per cent by malignant tumors and diseases of the digestive system. There were 110,103 World War veterans discharged after treatment for diseases or conditions not connected with service and 10,829 for disabilities of service origin. Of the veterans admitted to hospitals during the year, 89 per cent had served in the World War and 7.6 per cent in the Spanish-American War. Veterans remaining in domiciliary status totaled 11,038, as compared with 9,586 for the previous year.

On June 30, 1937, the administration was operating hospital facilities at eighty-one locations in forty-three states and the District of Columbia, providing a total of 47,421 beds, an increase of 1,548 in the number reported in the previous year. The increase would have been larger but for the discontinuance of general beds in a number of unsuitable buildings, in that the increase in beds for mental patients alone was more than 30 per cent greater than that shown for all facilities. The only new facility opened was one at Mendota, Wis., which has a capacity of 236 beds for mental patients. The facility at Fort Harrison, Mont., which was closed in October 1935 because of damage caused by earthquakes, was reopened in February 1937. At the end of the year the administration was using 2,159 beds in other government hospitals. When the approved and proposed construction and expansion work is completed, it is estimated there will be 55,978 hospital and 19,397 domiciliary beds, a combined total of 75,375 or 11,729 in excess of the number June 30, 1937.

A total of 1,079,388 physical examinations for outpatient purposes were made, a decrease of 14,721 from the previous year. Of the total, 1,063,001 or 98 per cent, were medical and 16,387 or 2 per cent, dental. There were 895,208 treatments furnished during the year as compared with 1,166,095 last year, a decrease of 270,887, 816,702, or about 91 per cent, were medical. The net operating expense for all hospital and domiciliary facilities totaled \$47,550,583.67 of which \$43,251,534.53 was for hospital and \$4,299,049.14 for domiciliary facilities. This amount does not include expenditures for new construction, major alterations, nonexpendable equipment or those for the diagnostic centers at San Francisco and Hines, Ill. There was a daily average of 41,939 patients of all types under treatment and a daily average of 10,364 beneficiaries receiving domiciliary care, as compared with 40,972 and 12,008 respectively during the fiscal year 1936. The per diem cost of operation for hospital facilities used principally for the treatment of tuberculosis was \$4.13, as compared with an earlier cost of \$3.90. For hospital facilities devoted exclusively to the treatment of neuropsychiatric disease, the rate was \$1.96 as compared with \$1.99 the previous year. It was \$3.66 in facilities for the treatment of general medical and surgical conditions, an increase of 3 cents over last year. For all hospital facilities, the per diem rate was \$2.81 as compared with \$2.82 in 1936. The per diem cost of operation for domiciliary facilities was \$1.13, an increase of 11 cents over last year. About \$566,843.868 was spent in the various states and the District of Columbia on veterans and their dependents for both direct and indirect benefits.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 29, 1938

### The Future of the Family Doctor

The profession is much exercised by the question of the future of the family doctor, in the face of the increasing control of the practice of medicine assumed by the government. In an address to a London division of the British Medical Association on "The Future of the Family Doctor" Lord Horder said that all was not well with him. He found himself obstructed in his work, which was to some extent discredited. He had lost caste, he was discouraged and he felt insecure about his own future and the future of the profession. The actual position was not quite so bad as this bald summary suggested, but each of the statements was true: some of them were true of all physicians and all of them were true of some. Perhaps the thing that bothered the family doctor most of all was the sense of insecurity, the feeling that he did not fit into the scheme of things, that he had not found his proper niche. It was possible to conceive him, given plenty of help from without and initiative from within, finding his proper place in the modern developments with regard to health. But not only had the function of the family doctor in respect to a general scheme of national health never been defined, it had never been properly considered. As the family doctor remained in this country the one person who, in the majority of cases, kept direct contact with the citizen in health matters, when difficulties arose he was the one to be "shot at," or his place taken from him by some part of a machine with which he was not officially associated.

Lord Horder believed that the family doctor was capable of being the most valuable member that society possessed. Society was aware of that and it was because the doctor stood so high in public esteem that, when fiction degraded his standing, the story became a "best seller." If coordination of medical services was to be achieved, it could be done in one of two ways. As basic principles on which physicians were agreed, Lord Horder said that preventive and curative medicine should be available for all members of the community, that the family doctor was indispensable for securing this, that free choice of doctor and continuity of medical care must be maintained, that the doctor should have easy access to institutional facilities and to consultant and specialist help, that there should be means of making contact with the family as a unit both when fit and when any member was sick, and that the doctor should be encouraged and helped to maintain this efficiency after qualification.

With regard to the maintenance of the doctor's efficiency after qualification, the state was slow to discharge its duty in this respect and the remedy for a time must come from within. The isolation of doctors, especially in country districts, was dreadful. Partnership helped to some extent, and service at local hospitals helped more, as also did regular attendance at meetings of the divisions of the British Medical Association. But postgraduate facilities must be extended. The doctor himself, if he was that sort of man, must change his attitude and instead of being suspicious of his colleagues, of officialdom and even of patients, must realize that he could have control of the situation. With the doctor no longer plowing a lonely furrow, a better result would be achieved than by socialized medicine.

### A Psychiatric Research Bureau

By means of the support of the Rockefeller Foundation, a bureau for the assistance of research workers in psychiatry has been established in London under the auspices of the Royal Medico-Psychological Association. On notifying the secretary of the bureau a psychiatrist who wants special information as

to what is at present known on any subject will receive a bibliography of all recent papers with abstracts of those which seem of great importance. If he should then desire abstracts of any particular papers, especially those in foreign languages, they will be made for him on demand. Any worker who wishes to begin some particular research may obtain information as to what has already been done and what methods of procedure are advised for further work. A worker who desires elucidation on points of technic will be advised directly from the bureau or be put in communication with the appropriate members of a panel of experts who have consented to advise on technical questions. Workers who desire the loan of technical manuals may obtain them on application. Workers who desire to see personally the application of methods of research or treatment or to confer personally with experts will be eligible to receive small grants to enable them to do so. These grants are intended to cover the expense of visits of a few days to laboratories at home or abroad. A short account of recent advances in subjects of particular interest, with a fairly complete bibliography, will be issued at intervals and sent to psychiatrists who desire to receive it. Psychiatrists who want to be put in communication with other workers abroad can receive help from the bureau. The services of the bureau will be available to any psychiatrist working in the British empire.

#### Plans for Maintaining the Food Supply in War

Plans for maintaining Britain's food supply in time of war or great national emergency are advanced but have only now been made public. In event of war a national food controller would be appointed to direct the work of fifteen divisional food officers, who were appointed last November to create "shadow" organizations throughout the country for the control of supplies and prices. When the scheme comes into operation, all ships on the high seas under British or neutral flags will be instructed as to the ports which are open and free from air attacks and be directed to make for them. Britain remains the biggest market in the world for food, and war would not alter this situation. Though there might be some losses, it is thought certain that with the measures contemplated the bulk of Britain's imported food would arrive. All the food trades of the country have been cooperating in the scheme. Complete figures of stocks available and resources which could be used in case of emergency have been obtained and have revealed that the stocks of food in the country are far greater than before the great war. It is held that any dislocation in the national life from air raids would be the result of the first onslaught and that the intensity of the attack would rapidly diminish. The casualties of the attacking force would be formidable and the wastage in men and material so great that in a few weeks and certainly within three or four months any form of air attack likely to disturb the distribution of food would be negligible. As a precaution against sudden attack from the air there is in existence a skeleton plan for the complete decentralization of all the main markets in London and other big centers. It is possible that later it will be arranged that an "iron ration" will be kept in storage.

#### Tenth International Congress for Psychotherapy

The International Medical Society for Psychotherapy will hold its tenth annual congress at Oxford July 29-August 2. The congress will be under the presidency of Prof. C. G. Jung, who is assisted by a council representative of the British Medical Association, the British Psychological Society, the National Council for Mental Hygiene and other British organizations. The languages of the congress will be English, French and German, and summaries of the papers will be available in all three languages; adequate interpretation will be provided for the discussions. Delegations have been invited from the principal European countries and the United States. The object of the International Medical Society for Psychotherapy is to provide a platform for all schools of thought. Up to 1936 all the congresses of the society were held in Germany. The 1937

congress met in Copenhagen. The 1938 congress will be the first held in an English-speaking country. Owing to the increasing emphasis which is being laid on the emotional factor in disease, this congress is claimed to be of great importance. The fee for membership is about \$3. It will assist the organizers if those who intend to attend will at once communicate with the honorary secretary, Dr. E. B. Strauss, 81 Harley Street, London, W. 1.

#### PARIS

(From Our Regular Correspondent)

Jan. 29, 1938

#### Organization of Health Centers

The question how the inroads which social medicine is making on private practice can be combated has been discussed during the past two years. One solution offered was to establish health centers all over France which should be under the direct supervision of the local medical profession. These centers should include diagnostic, preventive and treatment departments. Without waiting for action by the organization which looks after public relations of the entire profession in France, the departmental (county) society in the Dordogne has already established a health center. In the preventive medical section, all persons sent by the collectivities who have signed a contract with the center will be examined without being obliged to pay. Those who are indigent, whether covered by social insurance or not, will be treated in the diagnostic and treatment sections at the expense of the collectivity by which they are referred. No patients will be received unless sent by a physician. Both general practitioners and specialists will constitute the staff of the health center. The patients will have free choice of a medical attendant. If the latter is not on duty, he will be notified and he can examine the patient at the center or at his office. Every member of the staff will be paid according to the services rendered, by the manager, after deduction of the expenses incurred in running the center. This sort of center enables the general practitioner to have the opinion of specialists for patients who are unable to pay full rates. It will also tend to suppress the present abuse of dispensaries and of public hospital competition with private practice.

#### Abuse of Dispensaries

The rapid increase in the number of dispensaries in France is being viewed with alarm by the medical profession. Many of the dispensaries are endowed institutions, but others are being organized by groups of physicians or employers to give medical care at rates far below those asked by general practitioners or specialists engaged in private practice. According to an editorial in the Nov. 11, 1937, issue of the *Concours medical*, in some of these dispensaries the attending staff is composed of physicians who comply with the code of ethics only in treating patients who cannot afford to pay a physician. There is a great temptation for a young practitioner, who finds it difficult to earn a living, to join a dispensary staff. The question as to which of these institutions should be allowed to continue to exist is one necessitating an immediate investigation. The abuse of dispensary practice has grown to such an extent that some physicians organize them as sources of income and consider them as their private property which can be transferred to others for a consideration.

#### Overcrowding of the Profession

Since the World War there have been many complaints on the part of practitioners that the profession is overcrowded. The two chief causes have been the influx of physicians from other countries and the constantly increasing number of young men who wish to become physicians. Since 1934 the medical schools have not only lengthened the number of years in the curriculum but ordered all examinations in the first two years to be written instead of oral as in the past. The requirements

for admission to medical schools were raised, so that in 1936 there were 509 less eligible candidates than in 1935. Although the conditions which foreigners must fulfil before being allowed to practice in France or its colonies have been made much more strict, there is still dissatisfaction at the ease with which the authorities grant naturalization to foreign physicians. The conditions which a foreigner must fulfil at the present time in order to practice here are the following:

1 He must have a diploma from a French medical school. There are two types of diplomas: one, termed university diploma, does not require the possession of a bachelor of arts degree from a French university and hence does not entitle the holder of the diploma to practice here. The other, the so termed state diploma, requires the candidate before being admitted to a medical school to have a bachelor of arts degree from a French university. No bachelor of arts degree of a foreign university is acceptable.

2 The candidate must be a French citizen except in the case of certain countries which do not require a physician who has received his degree in France to become naturalized. Formerly those who had received diplomas in Rumania or Mauritius were not obliged to be naturalized, but this exception is no longer allowed. Foreign physicians who are not required to become French citizens and who wish to practice here are not obliged to take the courses of the first three medical school years but must pass all examinations of the other years.

3 If a foreign physician is naturalized here, he must serve in the armed forces for the same length of time as a native physician.

In 1936, forty-eight physicians and fifty-four medical students and up to Aug. 1, 1937, sixty-three physicians and thirty-seven medical students were naturalized here. To control those practicing following passage of the recent laws, every physician was obliged to send his diploma to a committee in each department composed of representatives of the government and medical profession. The result was that 800 physicians were found to be practicing without a diploma. In one case, prosecution of a flagrant violator, a Dr. Hecker, who had practiced in a large town in northern France for twenty years, aroused a great deal of local opposition. An effort is being made here as in the United States to have a board in each specialty grant diplomas to those who can qualify as specialists.

#### Obligatory versus Optional Retirement at Sixty-Five

A bill was introduced in the chamber of deputies in June 1936 by Mr. Pomaret, which would oblige members of all liberal professions to surrender their diplomas or licenses to practice on reaching the age of 65 years. This proposed law has aroused a great deal of discussion and the first reaction of the medical profession was violent opposition. Later, however, to neutralize the effect of the possible passage of such a law, a plan was proposed which included voluntary retirement. Every practitioner would be obliged to pay a certain annual premium until he reached the age of 65, at which time he was entitled to an annuity if he wished to retire. Such an insurance plan became necessary, as those who advocated passage of the law made no provision for the government to pay practitioners an old age pension even though they were obliged to retire at the age of 65. The question is discussed in the annual 1937 report of the secretary of the association which looks after the interests of the medical profession in France. Following numerous meetings with the representatives of other liberal professions, it was agreed that voluntary retirement was acceptable. In other words, each profession would establish a fund so that its members could be sure to receive an adequate annuity on reaching the age of 65, if the member wished to retire and had paid the premiums regularly. Before the two recent devaluations of the franc the annuity following retirement amounted to 24,000 francs. In order to pay this to an estimated 2,390 physicians who were entitled to ask for

voluntary retirement from practice it would be necessary for the treasurer to receive over 57 million francs annually in premiums. This sum would be inadequate if after the physician's death the annuity must be paid to the widow. To lighten the burden for the beginner and for older practitioners, the secretary proposes that a patient pay 5 francs for every certificate filled out by the practitioner. Such a tax, payable to a retirement fund already exists in Italy. In addition, a tax of 1 franc should be added to every prescription.

If this insurance plan to provide for voluntary retirement is adopted, practitioners who at present are nearing the age limit of 65 years will benefit because they have a relatively short period during which premiums must be paid. If the insurance plan is adopted, there will no doubt be many members of all the liberal professions ready to retire if they are sure to receive an annuity.

#### Acute Infectious Diseases During 1936

At the Dec. 11, 1937, meeting of the Académie de médecine a report was submitted by Professor Tanon on the acute infectious diseases in France during 1936. There was a decrease in the number of cases of typhoid all over the country. Only 922 were reported in the department of the Seine, in which Paris is situated, as compared to 1,276 in 1935. In one department, in which many shellfish are eaten, there is still a relatively high incidence of typhoid. There has been a marked decrease in the number of cases of diphtheria. Poliomyelitis is less common in France than in many other countries. Brucellosis appears to occur only in certain departments in northeastern France. Aside from a few cases of variola of foreign origin, this type of infectious disease was not reported in 1936. Epidemic cerebrospinal meningitis was reported in relatively small number, fifty-two cases, from Paris. In general, sanitary conditions in 1936 showed a marked improvement over 1935.

#### BERLIN

(From Our Regular Correspondent)

Jan. 3, 1938

#### New Views of the Pathogenesis and Course of Diphtheria

Diphtheria of the nasopharynx is considered a primary localized disease of the mucosa with secondary general symptoms. Infection in man may be checked by administration of antitoxin prior to manifestation of the disease or at its outset. Increased antitoxin content of the blood is thus thought to provide protection against diphtheria toxin. Dr. Paschla, in a lecture before the Berlin Medical Society, declared that the foregoing assumptions were not always in accord with the clinical observations. The antitoxin content of the blood may be high in the presence of diphtheritic infection and, conversely, the disease may not be manifested despite extremely low antitoxin values in the blood even if the person is exposed to the contagion. Nor is passive protective inoculation an absolute guaranty against infection, even if it is administered at the earliest possible moment. These contradictions led Dr. Paschla to a newer concept of the disease. Pharyngeal diphtheria never begins with a pathologic change in the throat but as an atypical high febrile generalized disorder, the typical pharyngeal symptoms are first manifested on the second or third day of illness, after the fever, namely, the principal general symptom has already subsided. He emphasized that in diphtheria, as in other infectious diseases, a highly febrile initial stage should be interpreted as a manifestation of general bacterial infection. The subsequent throat condition then should be regarded as a focal reaction to the final annihilation of the agent. This theory Dr. Paschla attempted to verify by bacteriologic studies of the disease at its various stages. He adduced in support of the hypothesis the observation that smears are not infrequently negative for the bacilli prior to and at the beginning of the illness and that the organisms are quite likely to appear first

with the formation of the false membrane, namely, at the time they are being repelled. The course of the infection he explained as follows. First the bacilli penetrate the nasopharynx, then invade the blood stream and only finally are expelled through the nasopharyngeal lymphatics.

The final link in the chain of proofs of the general infectious origin of diphtheria would be the demonstration of bacilli in the blood, but this has not yet been accomplished. The organisms would have to be demonstrable at the beginning of the disease, namely, before the formation of the pharyngeal process, this presents a great difficulty.

In conclusion Dr Paschlaue stated that, despite the difficulties, the theory is at present gaining ground and bids fair to resolve the current discrepancies between theory and practical observation. The newer view would also explain the frequent absolute failure of serum in severe cases of diphtheria on the basis of an anterior resorption of lethal quantities of toxin during the stage of generalized illness. Furthermore, the theory would elucidate those instances in which the disease is manifested despite passive immunization, namely, despite increased antitoxin titer in the blood. The new point of view demands a maximal exercise of critical judgment and caution in the evaluation of active protective inoculation against diphtheria.

In the discussion that followed Dr Paschlaue's talk, Professor Opitz disagreed with the author's view. Opitz still regards diphtheria as a local infection and favors the hypothesis of Professor Bessau, Berlin ordinarius in pediatrics, who considers the diphtheria bacillus a saprophyte for which the way is made ready by a nonspecific angina. Opitz considered Paschlaue's concept as by no means proved.

#### Campaign Against Benzene Poisoning

Incident to the increased use of benzene as a solvent in Germany, the National Health Bureau has issued a circular of "Information with Regard to Benzene." Instances of severe and often fatal benzene intoxications have shown that many industrial workers and even industrial executives are not sufficiently conversant with the dangerous character of the substance. This pamphlet takes up the question: Is benzene injurious to health? A warning is sounded against the disturbances which result from inhalation of large quantities of benzene vapor and which may prove fatal. The injuries caused by inhalation of smaller quantities of benzene or by a slowly acquired intoxication were described. Preventive measures are then discussed. Benzene vapors should be immediately drawn off even from the manufactured materials in which, on account of its heaviness, the benzene vapor is likely to sink to a low level and there remain. Receptacles containing benzene should be kept closed. The protection of the individual worker is discussed. In addition to specific instructions in the proper handling of the substance, general hygienic measures are recommended. Attention should be paid to oral and dental hygiene. At the first indication of benzene poisoning, medical advice should be sought immediately.

#### Prof Paul Ernst is Dead

Professor Emeritus Paul Ernst, for many years ordinarius in pathologic anatomy and director of the Institute of Pathology at Heidelberg, died recently, aged 78. Ernst came originally from Zurich. He first served for many years at Heidelberg as assistant and as extraordinary professor of pathology. Subsequently he collaborated with Edwin Klebs, with Eichhorst at Zurich and with Robert Koch at Berlin. He served from 1900 to 1907 as ordinarius at Zurich and in the same capacity at Heidelberg from 1907 to 1928. He contributed to the elucidation of fundamental problems of general pathology such as the death, degeneration and new formation of cells. Thanks to a remarkable background in philosophy, Ernst was able to discuss these problems in their widest implications. He was an authority on pathologic alterations of the nervous system and was especially valued for well arranged, animated lectures.

#### VIENNA

(From Our Regular Correspondent)

Jan 12, 1912

#### The Viennese Medical Profession

Apropos of the impending reorganization of the medical profession in Austria, made necessary by the constitution of 1911 detailed investigations have been undertaken of the "volk zu c horigkeit" (nationality) of the entire membership of certain medical organizations. Dr Sonnenfeld has made an assiduous study of this question since he, like many of his colleagues is technically "volksfremd" (an outsider)", that is, not of Viennese origin. The author differentiated two groups of doctors in Vienna, those born before 1900 and those born after 1900. Under the present law each applicant for a license to practice medicine must submit a matura-zeugnis (certificate granted on completion of preuniversity work) acquired either in the present Austrian republic or in one of the regions which became severed politically from Austria at the break up of the old dual monarchy in 1918 and the independence of which was recognized by the treaty of Saint Germain. Viennese doctors born subsequent to the year 1900, namely, persons who could not have been more than 18 years old in 1918, must without exception obtain a New Austrian matura-zeugnis, which is granted only to citizens of Austria. Sonnenfeld found that, out of a total of 4,547 Viennese physicians at the close of 1935, 1,411 men and 150 women were born before 1900, 728 men and 114 women after 1900. This means that 2,403 doctors in all were born in present-day Austria (Vienna and the eight provinces). Viennese doctors who were natives of other sections of the old Austro-Hungarian empire numbered 156 men and fifty three women born before 1900, and 277 men and 101 women born after 1900. A further eighty-nine doctors were born in other European and non-European countries.

The foregoing complicated data on national origins and birth place are based on two factors: (1) in former years Vienna as the center of a huge state of 60,000,000 population attracted large numbers of people and (2) many civil and military officials were sent from Vienna into the provinces, where their children attended schools. Besides, many Austrian subjects residing abroad sent their children to be educated in Austria. The statistics further show that of 4,547 doctors registered in Vienna (including young hospital interns) not less than 400 were born in present-day Austria or in old Austria-Hungary. Of the other 467 doctors, the overwhelming majority were Austrian subjects at the time of their birth despite their foreign birthplace. Only an insignificant number of doctors are in the true sense foreigners, who through nostrification of their diplomas have been permitted to practice medicine in Vienna. Sonnenfeld thus reveals that the outcry against the "preponderance of foreigners" and the clamor for an unadulterated "national medical profession" are only malicious, political propaganda emanations from certain interested cliques. Sonnenfeld also investigated the religious affiliations of Vienna doctors, as in many of the same circles which complain of the preponderance of "foreign" doctors the assertion is made that a majority of Vienna doctors are Jewish. It is true that although Jews number 10 per cent of the total population of Vienna, they number nearly 30 per cent of the medical profession. Yet at present scarcely 10 per cent of private salaried medical positions and scarcely 2 per cent of medical posts in the municipal and federal services are held by Jewish doctors.

#### Roentgen Irradiation in Diseases of the Blood

The abundance of data collected in the last year forms a basis for evaluating total roentgen irradiation as against the multiple-field irradiation in diseases of the blood. The irradiation applied in particular to erythremia and leukemia. Professor Sgalitzer recently lectured on this theme in his seminar. In erythremia total irradiation is indicated rather



than multiple field irradiation. Recidivation is not manifested so soon after total irradiation as following local irradiation. Moreover, the latter method requires less time than the local method. Total irradiation also obviates the danger of lesions on the skin, since particular cutaneous areas receive but mild emanations, only the spatial dose being large. Frequent blood counts with particular regard to the leukocytes should be considered indispensable to the routine of irradiation.

There is no doubt that total irradiation of the body is an improvement in the therapy of the leukemias. In myeloid leukemia optimal results may be elicited by total irradiation alone within the first two years of illness, if the disease is of longer duration, the total treatment should be combined with local irradiation of the spleen. In lymphatic leukemia a combination of the two procedures is indicated from the beginning, the total irradiation should be supplemented by mild irradiation of the spleen and other glands. The disease usually assumes a less severe course if the foregoing procedures are employed. Total irradiation postpones recidivation and is a favorable influence in cases in which local irradiation alone is no longer followed by a favorable reaction. Total irradiation cannot, of course, alter the ultimate outcome of the disease. Observation of the blood count is of the greatest significance for the performance of roentgen therapy. In any event total irradiation represents a noteworthy advance for the practitioner who treats leukemia.

#### The Prescription of Narcotic Drugs

In Austria there has existed for years a statute governing the sale and medical prescription of substances classed as narcotic drugs. The statute sets forth that a doctor may prescribe these "poisons" only for curative purposes. Their use as anodynes is not, strictly speaking, permitted by law, although the statute does not expressly prohibit this practice. But this legal loophole offers scant protection to the practitioner if, as repeatedly happens, charges of illegal prescription of morphine, cocaine, heroin, scopolamine and similar drugs are instituted against him. A decree of the ministry of justice in 1930 and a decision of the supreme court in 1936 both aimed at a clarification of the situation. These declare "expressis verbis" that the administration of narcotics may serve a curative purpose not only by removal of a morbid condition but also as a prophylaxis of further impairment of the health or again merely if it palliates pain associated with disease. But the statute still contains no express provision in this regard. Accordingly, the Austrian Chamber of Physicians has petitioned the health ministry for a revision of the law so that doctors who in good faith have prescribed narcotics will no longer risk being haled into court. The chamber recommends that the statute should be amended to read as follows: 'A physician is authorized to prescribe the use of narcotic drugs whenever such prescription serves a curative purpose or a therapeutic effect.' But the difficulties do not end there, for even a revised statute must conform to existing international conventions.

#### Death of Prof. Dr. Otto Kren

Prof. Dr. Otto Kren, since 1912 director of the dermatologic service of Vienna City Hospital, died recently. Kren's principal contributions to science, his studies of dermatoses of the buccal mucosa and of skin tuberculosis, were carried on during his younger years while he served as assistant to Prof. Dr. Riehl at the Vienna General Hospital. Kren established at City Hospital a center for the treatment of eczema, which interested many foreigners as well as Austrians. Professor Kren was elected president of the Specialists' Association on the basis not only of his perseverance and eloquence but of his sterling character. This came at a time when the Austrian profession was being menaced by political elements that wished to reduce all physicians to the status of public health employees.

Had these elements prevailed, it would have meant an incisive "change" in the economic circumstances of all physicians. Kren also used his position to effect an entente cordiale between the specialists and the rest of the profession, especially as regards problems related to the great expansion of the sick insurance clubs. Kren maintained a large private practice. He was 61 at the time of his death.

#### Death of Prof. Dr. Gustav Gaertner

One of the best known Viennese internists, a man of international reputation, has just died. Prof. Gustav Gaertner has been taken in the midst of his activity at the age of 82. As a young man he served as assistant to Prof. Dr. Salomon Stricker at the then newly founded Institute of Physiology and Experimental Pathology. From Stricker, who was an eminent technician and a pioneer in this field, Gaertner received an excellent training in scientific research. It was his duty as assistant to prepare and perform experiments in conjunction with his chief's lectures. Gaertner early published a number of reports on research observations. Many new techniques and apparatus both theoretical and practical were elaborated by him among others, the tonometer, the educational use of projection slides, the rheostat, the hemoglobinometer, the electric two cell bath. His studies of metabolism led him to devise the Gaertner method of fat reduction in obesity. In addition, milk fat as a rational food for nurslings, the infusion of common sodium chloride solution in cholera (a disease formerly no rarity in Central Europe) and the utilization of oxygen in the therapy of gas poisoning, all stem from this gifted experimenter in therapeutic methods. Following his retirement from the institute Gaertner devoted himself to private practice and became one of the most beloved and sought after doctors of old imperial Austria. For many decades he continued active in Vienna as a perspicacious diagnostician and many-sided therapist.

#### Death of Prof. Dr. Alfred Fischel

The death at the age of 69 of Prof. Dr. Alfred Fischel, embryologist, has just been reported. Fischel received an excellent education in his native city of Prague and came to head a special department of experimental embryology. In 1916 he was called to Vienna as ordinarius in embryology. It was he who organized the new Institute of Embryology. Fischel's special fields of research were embryologic malformations. He also studied the development of the gonads and the liver. He edited the *Zeitschrift für Wissenschaftliche Biologie*, the leading biologic journal in Europe. Two years ago Fischel retired from the university faculty to devote himself to scientific research.

## Marriages

JOHN THOMAS HANNA, Burlington, Iowa, to Miss Frances Louise Mast of Crawfordsville, in Oelwein, Dec. 24, 1937.

HENRY A. BELAFSKY, Woodbridge, N. J., to Miss Rose Buckner of New Brunswick, at Newark, January 2.

CLARENCE E. GILLESPIE, Memphis, Tenn., to Miss Diane Ruth Denton of Slate Spring, Miss., Dec. 8, 1937.

HENRY LYLE HARRELL, Dade City, Fla., to Miss Frances Louise Allen of Chapel Hill, Tenn., recently.

HENRY CHARLES FRECH, JR., Savannah, Ga., to Miss Irma Claire Booth at Athens, in December 1937.

FRANK NORMAN GIBSON to Miss Marce Perriman, both of Thomson, Ga., in December, 1937.

WILLIAM B. HOOKS to Miss Mary Nash Norfleet, both of Tarboro, N. C., Dec. 28, 1937.

JOHN S. DENHOLM to Miss Mary Gladys McBane, both of Durham, N. C., Dec. 7, 1937.

HOWARD CLARK GLOVER to Miss Margaret Atwood Trapnell, both of Newnan, January 1.



## Deaths

**Cary Travers Grayson** \* Rear Admiral, U S Navy, retired, chairman of the American Red Cross, died, February 15, at his home in Washington, D C, aged 59. Dr Grayson was born in Culpeper County, Va, Oct 11, 1878. He received his medical degree from the University of the South Medical Department, Sewanee, Tenn, in 1903, in which year he was commissioned acting assistant surgeon, U S Navy. He graduated from the U S Naval Medical School in 1904, in 1916 was made a medical director with rank of rear admiral, and was retired from the navy in 1928. He was surgeon of the President's Yacht *Mayflower* attending and consulting physician to the Naval Dispensary, Washington, during the Roosevelt and Taft administrations, and also served as physician to President Woodrow Wilson. Thus, he was responsible for the health of three successive Presidents. Dr Grayson was appointed chairman of the American Red Cross in 1935 and later chairman of the League of Red Cross Societies. He was chairman of the board of directors of the Gorgas Memorial Institute of Tropical and Preventive Medicine, a fellow of the American College of Surgeons, medical member of the Council of National Defense, a member of the staff of the Emergency Hospital, the Eye, Ear, Nose and Throat Hospital and the Providence Hospital. Dr Grayson received the honorary degree of doctor of laws from William and Mary College, he was awarded the Navy Cross by the United States and was made a Commander of the Order of Leopold (Belgium) and Commander of the Legion of Honor (France).

**Shelbey Boone Hinkle** \* Little Rock, Ark., University of Arkansas School of Medicine, Little Rock 1915, professor of obstetrics and gynecology at his alma mater, member of the Central Association of Obstetricians and Gynecologists, fellow of the American College of Surgeons, past president of the Pulaski County Medical Society, served during the World War, chief of the obstetrical staff of St Vincent's Infirmary, member of the obstetrical staff of the Little Rock General, Pulaski County and Baptist State hospitals, member of the consultation staff of the Missouri Pacific Hospital, aged 54, died suddenly, Dec 5, 1937.

**Elijah Mark Houghton**, Detroit, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1894, fellow of the American College of Physicians, lectured in pharmacology at the Detroit College of Medicine and Surgery and as a special lecturer at his alma mater for thirty-four years associated with the biologic and research laboratories of Parke, Davis & Co., retired in 1929 after nineteen years as director, was a delegate in 1908 of the U S Department of State to the International Congress of Applied Chemistry in London, aged 70, died, Dec 12, 1937, of carcinoma of the head of the pancreas.

**Henry Rutledge Donaldson**, Atlanta, Ga., Atlanta College of Physicians and Surgeons, 1899, past president of the Fulton County Medical Society, member of the Medical Association of Georgia, fellow of the American College of Surgeons, served during the World War, visiting surgeon to the Grady and Crawford W Long Memorial hospitals, and St Joseph Infirmary, aged 59, died, Dec 25, 1937, of occlusion of the left popliteal artery.

**William Wallace Brooke** \* Bayonne, N J, Columbia University College of Physicians and Surgeons, New York, 1900, past president of the Hudson County Medical Society, fellow of the American College of Surgeons, city health officer, visiting surgeon and gynecologist to the Bayonne Hospital, aged 59, died, Dec 26, 1937, of fracture of the skull due to a fall.

**William Campbell Buntin** \* Staten Island, N Y, University of Pennsylvania Department of Medicine, Philadelphia, 1902, served during the World War, past president of the Richmond County Medical Society, health officer of the borough of Richmond, aged 58, died, Dec. 19, 1937, in the Staten Island Hospital, of peritonitis and ruptured appendix.

**David Robert Brodsky**, Providence, R I, Tufts College Medical School, Boston 1929, member of the New England Obstetrical and Gynecological Society, on the staffs of the Miriam, Lying-In and Homeopathic hospitals, aged 34, died, Dec 11, 1937, in the Beth Israel Hospital, Boston, of myelogenous leukemia.

**Martin L Mayland** \* Faribault, Minn., University of Minnesota College of Medicine and Surgery, Minneapolis 1892, past president of the Rice County Medical Society, on the staff of St Lucas Evangelical Deaconess Hospital, aged 69, died, Nov 16, 1937, at Rochester, Minn., of Hodgkin's lymphosarcoma.

**Harvey Oliver Brannon**, Fort Worth, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1905, member of the State Medical Association of Texas, served during the World War, aged 55, died Dec 7, 1937, of coronary thrombosis, hypertension and myocarditis.

**James Malachi Coble** \* Dallas, Texas, Vanderbilt University School of Medicine, Nashville, Tenn, 1887, formerly lecturer on minor surgery and bandaging at the Southwest Texas University Medical Department, later known as the Southern Methodist University, aged 83, died, Dec 1, 1937.

**Richard Henry Fuhrmann** \* St Louis, Washington University School of Medicine, St Louis, 1903, formerly lecturer on obstetrics and gynecology at his alma mater, aged 57, on the staff of the Evangelical Deaconess Hospital, where he died, Dec 21, 1937, of carcinoma of the right lung.

**William Arthur Atkins** \* Rogersville, Mo., St Louis University School of Medicine, 1905, past president of the Webster County Medical Society, owner of the Rogersville Hospital, aged 59, died, Dec 21, 1937, in the Research Hospital, Kansas City, of coronary thrombosis.

**John Benjamin Shelton**, Dania, Fla., Washington University School of Medicine, St Louis, 1896, past president of the Morgan County (Ala.) Medical Society, aged 76, died, Nov 29, 1937, in a hospital at Fort Lauderdale, of hypertrophy of the prostate and pneumonia.

**John Edward Daugherty**, Jamaica, N Y, Barnes Medical College, St Louis, 1902, served during the World War, superintendent of the Jamaica Hospital and formerly medical director of the Jewish Hospital, Brooklyn, aged 61, died, Dec 13, 1937, of cerebral hemorrhage.

**Abraham Weinberg**, Kansas City, Mo., University Medical College of Kansas City, Mo 1910, served during the World War, aged 49, died, Nov 30, 1937, in the Veterans Administration Facility, Wadsworth, Kan., of arteriosclerosis, heart disease and nephritis.

**Edward Chambers**, Millington, Tenn., University of Louisville (Ky.) Medical Department, 1893, served as a magistrate and for many years member of the county school board, aged 65, died, Dec 22, 1937, in the Methodist Hospital, Memphis, of pneumonia.

**Jefferson C Crossland**, Zanesville, Ohio, Medical College of Ohio, Cincinnati, 1887, for many years a member of the state board of health, and member of the city board of education, aged 78, died, Dec 7, 1937, in the Bethesda Hospital, of pneumonia.

**John Earl Black**, Centralia, Ill., Loyola University School of Medicine, Chicago, 1927, member of the Illinois State Medical Society, aged 42, on the staff of St Mary's Hospital, where he died, Dec 28, 1937, of appendicitis and chronic myocarditis.

**Laura Blanche Bennett** \* Los Angeles, Willamette University Medical Department, Salem, Ore, 1901, for many years deputy director of the department of health and corrective education, aged 69, died, Nov 7, 1937, of pelvic carcinoma.

**Philip Samuel Perkins**, Sulphur, La., Tulane University of Louisiana School of Medicine, New Orleans, 1919, formerly coroner of Vernon Parish, aged 42, died, Nov 29, 1937, in St Patrick's Hospital, Lake Charles, of pneumonia.

**John Adolph Wagnetz** \* Philadelphia, Jefferson Medical College of Philadelphia, 1916, on the staffs of the Northeastern Hospital, St Luke's and Children's Hospital, aged 44, died Nov 30, 1937, of coronary thrombosis.

**C L Purdy**, Brodnax, Va., Southern Medical College, Atlanta, 1890, member of the Medical Society of Virginia, member of the county school board, died, Nov 29, 1937, in St Elizabeth's Hospital, Richmond.

**Horace Wilcox**, Wakefield R I, University of Michigan Department of Medicine and Surgery, Ann Arbor 1889, aged 71, on the staff of the South County Hospital, where he died, Nov 27, 1937, of vesical calculi.

**John Dominick Colson**, Brooklyn, Long Island College Hospital, Brooklyn, 1912, member of the Medical Society of the State of New York, aged 51, was killed, Dec 2, 1937, when he jumped from a window.

**Robert Benton Davis**, Holdcroft, Va., Medical College of Virginia, Richmond 1905, aged 62, died, Dec 23, 1937, in the Stuart Circle Hospital, Richmond, of coronary thrombosis, nephritis and uremia.

**Roy Richards Eaton**, Grand Rapids Mich., College of Physicians and Surgeons of Chicago, 1896, aged 63, died, Dec 7, 1937, of bronchiectasis, pulmonary abscess and chronic myocarditis.

## Correspondence

### THE PATENTS ON SCARLET FEVER AND OTHER MEDICAL PREPARATIONS

*To the Editor*—The communication of the Scarlet Fever Committee published in the Nov 27, 1937, issue of THE JOURNAL should not go unanswered. Any criticism must be directed at the manner in which the Dick patent has been handled by the Scarlet Fever Committee. The communication of the Scarlet Fever Committee draws a comparison between the 5 per cent royalty fixed for the Dick patent and the royalty of 10 per cent fixed by the Insulin Committee. These two patents were taken out under different circumstances in relation to the groundwork covered by previous investigators. The ten points of the Dick patent embrace a much wider field in scarlet fever than the insulin patent in diabetes. The Dick patent covers (1) not only the original strain of scarlet fever producing hemolytic streptococcus but all subsequent strains discovered and yet to be discovered before the patent runs out, (2) the original toxin and any new toxins of these other strains, (3) an antitoxin derived from the use of any of these toxins as antigens. Thus the field of scarlet fever in diagnosis, immunization and serum therapy is covered except for the part played by symptomatology and convalescent serum therapy. Any investigations of this disease are apt to involve the fields embraced by the Dick patent.

The Dicks' discoveries, however, were launched at a time when other investigators actively engaged in similar research were employing the same hemolytic streptococci derived from patients with scarlet fever. As soon as the patent was taken out the continuation of the work by these other investigators necessitated license from the holders of the patent. Furthermore, any future discoveries in the field embraced by the patent were to be controlled by the patent holders. A notable lawsuit took place in New York in 1930 over an infringement of the Dick patent. The judge handed down an opinion upholding the patentees, which was remarkable for its interpretation of the facts involved and its effort to placate the hostility between the opposing investigators. The question of priority was weighed and passed upon. The judge stressed the acclaim accorded by the medical profession to the Dicks' discoveries. The judge in his effort to bring about reconciliation mentioned that such a discovery as the Dicks' was only the beginning of further discoveries. He pointed to the discovery of the telephone and remarked on the enormous developments in this field over the past fifty years. However, he did not visualize the advances in scarlet fever in the next fifty years with a similar array of patents held and controlled by the Scarlet Fever Committee. He did not bring out that any one could develop the telephone in a simple laboratory without any license whatever, whereas no one could develop the discoveries embodied in the Dick patent without infringing on this patent, because scarlet fever is a disease of human beings, and the use of human beings in any extensive experiment would thereby constitute an infringement of this patent unless under license. It is this wide field embraced by the Dick patent which has raised objections as to its advisability because of possible interference with research.

Dr Elliott P. Joslin informs me that no objections have been raised against the insulin patent by research workers or clinicians. Consequently, the manner in which the Dick patent has been handled would appear to be the cause of the objections. The amount of fixed royalty from the Dick patent would hardly seem to be involved in these objections. It is entirely beside the point for the committee to raise this issue, and it is misleading to compare the operations of these two patents from the royalties derived.

Dr Fishbein (Medical Patents, THE JOURNAL, Nov. 6, 1937, p. 1542) asked a question that is much too serious to be tossed off by a mere assertion. The question as he put it is "How far should they [the Dicks] be entitled, under the patent granted them, to control research or other work with such products by other investigators?" This has been a main bone of contention and quarrel for some years. Perhaps this difficulty may be credited to the fact that the administration and control of the patent lie with the discoverers themselves rather than with some wholly disinterested body capable of viewing the matter objectively."

In answer the Scarlet Fever Committee asserts baldly that "Any implication to the effect that the Scarlet Fever Committee has interfered with research is wholly unjustified."

The baldness of this assertion lies in the fact that the date of publication of this letter is Nov. 27, 1937, and under date of Dec. 3, 1937, Dr Gladys H. Dick, for the Scarlet Fever Committee, Incorporated, wrote a letter to Dr Gaylord W. Anderson, lately appointed professor of preventive medicine and public health at the University of Minnesota School of Medicine, refusing him permission to continue in the state of Minnesota the research work that he had begun in Massachusetts. The grounds for this refusal were that "there is still no evidence available to indicate that such preparations contain any scarlet fever toxoid or that they have any virtue other than the free, unmodified scarlet fever toxin remaining in them" and that "the Scarlet Fever Committee has decided that it would be contrary to public interest to extend statistical experiments with this material beyond the limits of the state of Massachusetts, which affords a large enough area for any such experiment." If it is safe to carry on this experiment in one state why is it unsafe in Minnesota?

Whether Dr Anderson's formalized preparation is a toxoid or not is a matter of opinion and is not to be settled by the conclusions drawn by the Dicks in their scientific articles, to which they refer as "unrefuted evidence." Who could refute them without first obtaining a license? From a practical point of view three doses of this "toxoid" afford some degree of immunity to scarlet fever without making individuals sick in the process. The three doses originally recommended by the Dicks produced so much discomfort that a great many physicians preferred the dangers of scarlet fever to the effects of inoculation. Most of us have learned that a minimum of seven doses of the Dick toxin is the most desirable method from the standpoint of comfort. Nor was this learned from the Dicks. Our ambition is to achieve something, analogous to diphtheric toxoid, which can produce immunity to scarlet fever in three or fewer doses. Dr Anderson's investigations along this line are worthy of encouragement.

Here is a glaring instance of curtailment of research through the control of a patent. Whether other research, such as that conducted by Dr Dochez, was indirectly curtailed or interfered with by the Scarlet Fever Committee is no longer a subject that needs airing. That research in scarlet fever has been interfered with in the instance of Dr Anderson is sufficiently self-evident to suggest the possibility that other research has been and will be interfered with by this incorporated committee. For further evidence of interference with the patent, one has but to turn to this letter of defense of November 27, wherein the committee accepts Dr Fishbein's suggestion of the control of medical patents by a committee of the A. M. A., to wit: "Such an arrangement would give uniformity in methods of administration, would relieve the discoverers of onerous duties which interfere with further research they might accomplish." To many it appears that the Doctors Dick have assumed onerous duties in connection with their patent, which are unnecessary to say the least and which avowedly interfere with their own research.

Dr Fishbein has played an active part in the Dick patent controversy since the patent was taken out. He has perceived the trend of scientific opinion and has expressed himself carefully and to the point, much to the relief and satisfaction of those who deal with the problem of scarlet fever.

CONRAD WESSELHOEFT, M.D., Boston

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### TREATMENT OF CHOREA

To the Editor—Please discuss the best methods for treating chorea. Would you cite references. KURT B. BLATT, M.D., Haverstraw, N.Y.

ANSWER—The object of treatment in chorea is rapid termination of the purposeless movements and avoidance of complications. Early diagnosis is of utmost importance in the successful management. Adequate rest is the primary requisite. This, of course, includes both mental and physical rest. The child should be put to bed by himself—alone and away from the curious glances and staring of other children. He must be prevented from injury in striking against the side of his crib or bed. The ordinary hospital crib is preferable to the bed because of its size, which prevents falls. However, larger children will require a bed and restraints such as the "restraint jacket" as described by Dr. Stanley Gibson in Brennemann's "Practice of Pediatrics" (Hagerstown, Md., W. F. Prior Company, Inc., 1937, volume II, chapter 19, pp. 17 and 18). If a crib is used it should be lined with a padded material. This serves the purpose of preventing injury of the patient and preventing drafts from the frequently exposed limbs, and it serves to keep the child from trying to see what is going on about him. An attendant or nurse should be close by to keep a watchful eye on the child to prevent undue injury. The child should be fed by an attendant, as this attention insures not only greater food intake but also less possibility of embarrassment besides decreasing the muscular movements. The diet should be liberal and high in carbohydrates.

The type of sedation employed and the drugs used will depend on the severity of the choreic state. In the severe attacks, in which the movements are of such violence that the patient requires one or more attendants to keep him from falling out of bed, rapidly acting sedatives should be given. In these cases of the so-called chorea insaniens, soluble barbitol derivatives should be used orally, intramuscularly or rectally. Sodium amytal from 1 to 2 Gm. or pentobarbital sodium from 0.065 to 1 Gm. should be given orally as often as necessary to control the patient. Sodium amytal may be given intramuscularly in doses of 0.13 or 2 Gm. or the suppositories of pentobarbital sodium or sodium amytal may be given. For cases in which rapid sedation is not imperative the more common drugs chloral and bromides may be used rectally in the following dosage for a 10 year old child: chloral hydrate 1 Gm., sodium bromide 16 Gm. and starch paste as much as will suffice.

The modern conception of chorea holds that it is a self-limited process and that in the usual case the condition will improve in a period of from two to six weeks. This fact makes it difficult to evaluate the several therapeutic methods which have recently been advanced, and care must be exercised in appraisal of results of any of the methods mentioned.

Sodium salicylate and acetylsalicylic acid have been used extensively in the treatment of rheumatic infections, and this accounts for their introduction into the therapy of chorea. According to Gibson they are most effective in the acute cases, the dosage should be heavy, from 4 to 6 Gm. daily, and not long continued because of the danger of salicylism.

The use of hyperthermia in the treatment of chorea has found support in the last decade. Two methods have been suggested. The first makes use of the febrile reaction to typhoid vaccine when given intravenously (Sutton, L. P. and Dodge, K. G., *J. Pediat.* 3:813 [Dec.] 1933; Wetchler, *M. Rec.* 142:31, 1933). The second method of producing hyperpyrexia consists of the use of an electrically heated box or an inductotherm coil. The use of hyperthermia is not without danger, however, and persons with cardiac damage should not be subjected to it.

(Neyman, C. A., Blatt, M. L., and Osborne, S. L., *The Treatment of Chorea Minor by Means of Electroparalysis*, *The Journal*, Sept. 19, 1936, p. 938; Barnacle, C. H., Ewalt, J. R., and Ebaugh, F. G., *Artificial Fever Treatment of Chorea*, *ibid.*, June 13, 1936, p. 2046).

Before either of the hyperthermic techniques is applied the child must be in a hospital under careful supervision. None of these methods are without their ill effects and, as Gibson puts it, "the cure may be worse than the disease."

More complete discussions of treatment are given in Joseph Brennemann's *Practice of Pediatrics*, volume II, chapter 19 and by Carey Coombs in "Rheumatic Heart Disease," New York, William Wood & Co., 1928.

### WORMS IN CEREAL

To the Editor—The family of a youth aged 16 years is greatly exercised because he recently ate a bran cereal containing worms or larvae. What are the worms commonly found in cereals, flours and canned tobacco? Is their accidental ingestion dangerous or detrimental to health in any way except for the temporary psychic upset? A number of my learned professional friends start glibly to explain this common observation only to go into a tail spin. Some actual information would be appreciated.

MD Ohio

ANSWER—There are a number of different insects the larval stages of which feed in stored grain and package cereals. Among the commoner ones are the yellow meal worm (*Tenebrio molitor*) and the dark meal worm (*Tenebrio obscurus*), the larvae of small black beetles, both found in grain stored for a long time, the cadelle, or flour beetle (*Tenebroides mauritanicus*), the dirty white long-lived larva of which is about three quarters of an inch in length, found in mulls and granary, and the confused flour beetle (*Tribolium confusum*), the yellowish white larvae of which grow to three sixteenths of an inch in length and are the worst pests of package cereals. The larvae of the confused flour beetle secrete a sticky substance and become covered with dust or flour. They often reveal their presence in package cereals by adhering to the sides of the carton. A detailed account with illustrations of larval pupal and adult stages of these cereal pests is found in *Farmers' Bulletin 1260* by E. A. Back and R. T. Cotton, entitled *Stored Grain Pests*, obtainable from the Government Printing Office, Washington, D. C., price 5 cents. Being grain fed animals they are excellent food for carnivorous predacious insects such as ants, and would serve as food for man especially if cooked. They are objectionable mainly on esthetic grounds. If eaten alive and not killed by mastication, their movements in the stomach might cause temporary distress.

### POSSIBLE FATAL ASTHMA FROM INHALATION

To the Editor—1. Are there any cases on record of a rapidly fatal asthma due to the inhalation of a massive dose of foreign protein (e.g. dried powdered serum) by a person extremely sensitive to the protein? 2. Is such an occurrence theoretically possible? 3. In the event of death could the offending protein be with reasonable probability identified in the nasal secretion by the precipitin test? Is there any other post mortem test that might be helpful as to the cause of death?

MD Wisconsin

ANSWER—1. The number of case reports of fatal asthma does not exceed 200. No more than 25 to 30 per cent of the patients died in an attack, and an inhalant allergen was implicated in but few of these. Dried serum has not been mentioned as a cause of fatalities.

2. Yes it is "theoretically" possible. It is common knowledge that the inhalation of a powdered allergen (atopoin) will precipitate an attack of asthma. Whether or not this might progress to a fatal termination may depend on subsequent care. A case in point was reported by Hopkins, Benham and Kesten (*Asthma Due to a Fungus—Alternaria*, *The Journal*, Jan. 4, 1930, p. 6). These authors seemed to have established the clinical significance of the allergen as it occurred in nature. The patient was skin sensitive to the fungus. To complete the chain of evidence the patient was then caused to inhale a powder prepared by drying and grinding the washed felt from an old broth culture of *Alternaria*. This incited a typical paroxysm of asthma which required relief by ephedrine and which recurred at intervals for twenty-four hours. The difference between the non-fatal and the fatal attacks seems to be a matter of degree. The condition of the patient and the amount of the allergen inhaled may determine the outcome.

3. Inhalation shortly before death of a massive dose of protein might leave a sufficient trace in the nasal secretion to permit its identification. Most serums are active in stimulating the production of antisera (precipitins) in a heterologous species. Dried serum would be an active antigen in the precipitin test and in contrast to pollen would but rarely be found

in nasal secretions Identification of pollen, molds, animal emanations and the like by the precipitin test would be difficult if not impossible

A careful necropsy in an effort to exclude all other causes of death would be essential Several articles on the pathology and differential diagnosis of the various types of asthma have been published in the past two years The question is still a moot one

#### ETIOLOGY OF DERMATITIS HERPETIFORMIS AND SCLERODERMA

To the Editor—Please give the latest theories on the etiology of dermatitis herpetiformis and scleroderma Could either of these conditions be considered occupational? A white man claims to have developed dermatitis herpetiformis (diagnosis confirmed by several dermatologists) originally from doing foundry work in which warm oil fell on his arms causing blebs and blisters and later this developed into the generalized dermatitis herpetiformis A white woman claims that scleroderma developed as a result of her work as a spotter and presser in a cleaning establishment and as a spotter and dyer she came in contact with some of the chemicals used however at no time was there any evidence of arsenical poisoning

M D North Dakota

ANSWER—The cause of dermatitis herpetiformis is unknown Most authorities believe that the disease is due to toxemia, the origin of which is undetermined It has often been seen in persons who have undergone some unusual nervous strain or in those of neurasthenic type Dühring, who originally described the disease, states that it may be due to various causes, some of which are obscure in their origin, but that the nervous system is directly responsible for the cutaneous manifestations It has never been considered occupational and the accident referred to is coincidental

The direct cause of scleroderma is not known It is reported to have followed exposures to cold, to damp and to sunlight It has followed infections, such as scarlet fever, measles, diphtheria, tonsillitis, erysipelas, pneumonia and influenza, and has often been seen in association with disorders of the thyroid gland Many observers attribute an important part of its etiology to changes in the glands of internal secretion, especially the thyroid Some cases have been seen in association with adrenal insufficiency, while in others the vegetative nervous system has been blamed While trauma may be a contributing factor, it is extremely improbable that contact with chemicals used in a cleaning establishment can play any part in the production of the disease

#### RONNE STEP

To the Editor—What is the Ronne step in connection with the early symptoms of glaucoma? J C B DOUTHETT M D New Castle Pa

ANSWER—The Ronne step is a further sector-like defect in the upper or lower quadrants of the nasal field seen in cases in which there is already a general nasal field loss With progression of the disease, this sector scotoma advances and joins the scotoma continuous with the blind spot These field changes are seen in cases of glaucoma

They are found when using small test objects on a Bjerrum screen or tangent curtain at a distance of 1 meter from the patient Of course, the mate of the eye under examination is occluded and the test is more accurate when the head is fixed in a chin or head rest

#### CASTOR OIL AFTER OPERATIONS

To the Editor—On several occasions a stormy convalescence with ileus paralyticus following castor oil has been observed on the third day of pelvic operations on women I am unable to find castor oil recommended as such after treatment in available literature Is it not highly probable that the oil was the cause of the ileus? Could you quote any literature advising either for or against such treatment? M D Missouri

ANSWER—Administration of a laxative during the first few days after an abdominal operation should be avoided in practically all cases except those of great hazard in which it is anticipated that the patient may become dangerously distended with gas With the habitual use of a laxative on the third day, as was formerly routine with most abdominal surgeons, there was a high incidence of "gas pains" and distention with gas Avoidance of a postoperative laxative in all cases, except those with dangerous distention, has resulted in much less abdominal discomfort and a more peaceful convalescence It may be a good routine procedure to give a mild laxative on the fifth or sixth day, a small amount of oil having been introduced rectally in order to soften the inspissated fecal material

In those instances in which the operation has been a hazardous one, as a precautionary measure a laxative may be given on the morning after the operation during the period of "quiet before the storm" when the patient has not yet developed a distended stomach In such cases a favorite remedy is magnesia

magma, a teaspoonful or two every two hours until approximately an ounce has been given The magnesia stimulates peristalsis and thus imitates downward siphonage of the gastrointestinal contents If the amount given is sufficient to initiate cramps, an enema may be used, otherwise one is unnecessary if no more than 1 ounce (30 Gm) of magnesia has been given

There is no information on the harmfulness of castor oil in contrast with other laxatives, but it is surely distasteful to postoperative patients who are already somewhat nauseated A less distasteful laxative should be given preference unless the patient specifically requests the oil

#### LATE TREATMENT OF HAND INFECTION

To the Editor—A man aged 60 reported Aug 1 1937 with a typical midpalmar fascial space infection of the right hand General physical examination also revealed the presence of many badly infected teeth with no other abnormalities The abscess was widely opened under ether anesthesia about 2 ounces of thick pus being obtained The hand was dressed with the fingers grasping a roller bandage and continuous hot wet dressings were used for forty eight hours followed by daily hot soaks and all possible active motion of the fingers All drainage had ceased and the wound was healed by September 1 Since then physical therapy has been given three times a week The index finger and thumb are normal The middle ring and little finger cannot be extended more than 160 degrees at the interphalangeal joints and can be flexed to only about 75 per cent of normal Even now the patient cannot tolerate passive motion of these fingers beyond the limits stated Would the sinusoidal current help this man? Would anything be gained by forceful extension and flexion of the fingers under anesthesia? This is an industrial compensation case Any information that you will give me will be greatly appreciated The patient refuses dental care

M D, Kansas

ANSWER—The return of function after infection such as this patient has had is likely to be slow in a 60 year old man, and the presence of dental infection is doubtless a factor in retarding recovery Certainly, repeated efforts should be made to get the patient to consent to treatment of the oral infection, since it may be an important factor in preventing disappearance of the inflammatory reaction in the hand

Simple methods of physical therapy are much more likely to give results than drastic methods Soaking the hand in warm soapy water for half an hour three times daily and washing it constantly with a soft wash cloth during the period of soaking constitute simple and helpful treatment Such a method produces repeated hyperemia, the circulation is stimulated and the gentle movement involved is helpful in preventing contraction of scar tissue Forceful extension and flexion of the fingers under anesthesia should never be attempted in such cases Such measures serve only to tear tissue, to produce hemorrhage in the torn tissues and to stir up latent infection with the result that the reparative process is definitely retarded The use of various forms of electrical stimulation is much less likely to give helpful results than the simple method suggested

#### GASOLINE IN EYE AS POSSIBLE CAUSE OF CATARACT

To the Editor—A healthy man aged 35 complains of failing vision in the left eye The history is that three months ago a spray of tetra ethyl gasoline struck the left side of his face and filled the left conjunctival sac Intense burning and lachrimation followed but after a few hours the left and right vision seemed equally clear to the patient Several days later however vision in the left eye was noticeably more hazy and this blurring has increased so that today vision in the left eye is 20/200 and in the right eye 20/20 Shortly prior to the accident in an examination for a driver's license the two eyes had equal vision Examination reveals a rather uniformly opaque left lens Naphthalene is frequently reported as being responsible for the development of cataracts but I find no mention of gasoline being considered as an etiologic agent in the formation of cataract Have you an opinion as to the relationship of cataract to gasoline in such an accident?

FREDERICK FLERSTE M D Dubuque Iowa

ANSWER—In bulletin 48, entitled "Eye Accidents in Industry," published by the National Society for the Prevention of Blindness it is stated that In looking for the cause of cataract it would seem that at least two factors should be considered The one a modification of the protein of the lens by ultraviolet radiation and the other, the presence of certain inorganic salts by which the modified protein can be precipitated It is not known that ethyl gasoline provides either of the two requisites mentioned The lead content apparently may be ignored as the quantity present is minute The ethyldibromide, in which the tetra ethyl lead is believed to be primarily dissolved may be of greater consequence as it is more of an irritant Likewise the gasoline itself is highly irritating

Recently two cases were observed of double pterygium in naphtha workers (naphtha being chemically similar to gasoline) engaged in almost identical duties in the same plant Exact

proof is lacking that naphtha irritation caused these pterygia but the circumstances are suggestive. In the instance of cataract formation after ethyl gasoline exposure, it is possible neither to affirm nor to deny a cause and effect relationship. It is held that if the ethyl gasoline in any wise contributed to the occurrence, this contribution is probably in the realm of acceleration of the action of other and unknown factors operating to produce the cataract.

#### JEANS TEST FOR VITAMIN A DEFICIENCY

To the Editor—What is the technic of the Jeans test to determine whether or not there is a vitamin A deficiency? Information is needed in order to give the high vitamin A alkaline ash diet to a patient who has cystine and oxalate crystals in a stone passed.

ESTHER KILLIGREN Dietitian Elmira, N Y

ANSWER—For a discussion of the value of vitamin A in the treatment of urinary lithiasis see Report of the Council on Pharmacy and Chemistry, Vitamin A and Urinary Lithiasis, THE JOURNAL, Dec 14, 1935, page 1983. In 1934 Jeans and Zentmire at Iowa City described a photometric test for detecting moderate degrees of vitamin A deficiency as measured by the ability of a subject to adapt to darkness. In general terms, the technic may be described as follows. The subject is placed in absolute darkness for a definite interval of time, at the end of which a measurement is made of the threshold of light that is just perceptible to him. The subject then is asked to look directly at a bright light and after a short period of exposure to this light is again placed in darkness, and at stated intervals a test is made to determine the threshold of light intensities. The test is simple but requires the cooperation of the subject. Observations have been made with a Birch-Hirschfeld photometer and also with the so-called biophotometer, which is manufactured by the Frober-Faybor Company of Cleveland. In this connection it might be mentioned that in the *Archives of Ophthalmology* 18 821 (Nov) 1937, Jacob B. Feldman describes a simplified instrument for the qualitative study of dark adaptation. There is some difference of opinion among investigators regarding the present reliability of these tests for diagnostic purposes. Recent references to the technic of making the measurements and the interpretation of results obtained are available in the following papers:

Jeans, P. C., Blanchard, Evelyn and Zentmire, Zelma. Dark Adaptation and Vitamin A. THE JOURNAL Feb 6 1937 p 451.

Jeghers, Harold. Night Blindness as a Criterion of Vitamin A Deficiency. Review of the Literature with Preliminary Observations of the Degree and Prevalence of Vitamin A Deficiency Among Adults in Both Health and Disease. *Ann Int Med* 10 1304 (March) 1937.

Palmer, C. E. and Blumberg, H. The Biophotometer Test for Measuring Vitamin A Deficiency, *Pub Health Rep* 52 1403 (Oct 8) 1937.

Corlette, M. B., Youmans, J. B., Frank, Helen and Corlette, M. G. Photometric Studies of Visual Adaptation in Relation to Mild Vitamin A Deficiency in Adults. *Am J M Sc* 195 54 (Jan) 1938.

#### EFFECT OF RIFLE FIRE ON EAR

To the Editor—A patient is a frequent competitor in small bore rifle matches. The rifle is usually held with the cartridge chamber at a short distance from the ear. In protracted tournaments as many as 500 shells may be fired in one week. For a brief period following such engagements there is impairment of hearing. Is it likely that years of such activity will leave the hearing permanently impaired as is the case in boiler makers and similarly employed people?

M D New York

ANSWER—Loss of hearing may result from such situations. The insult to which the ear is exposed is of the type that may damage the organ of Corti and thus produce an irreparable impairment of the sound perception type.

#### BENZEDRINE AND HOMATROPINE AS CYCLOPLEGIC

To the Editor—At a recent postgraduate course a well known ophthalmologist in a lecture advocated the use of one drop of benzedrine sulfate solution 1 per cent followed twenty minutes later with one drop of 5 per cent homatropine as a cycloplegic, stating that these drugs were much better than atropine. I should like to know if it is safe to use these drugs in this way. Have they been used to any great extent?

J F MARTIN MD Dunn N C

ANSWER—The latest report by Dr Judd Beach recorded the satisfactory use of these cycloplegics in more than 200 cases. Others who have been trying the method have not mentioned the number of cases in which it was employed. Thus far, no ill effects have been reported. It is certain that in predisposed cases this cycloplegic as well as any cycloplegic that is accompanied by a mydriatic effect, will cause a certain amount of increase in intra-ocular pressure. Consequently, it behooves any physician using any drug that causes a dilatation of the pupil to be on guard continuously against increased intra-ocular tension.

#### PROMINENT VEINS OF HANDS

To the Editor—A woman, aged 22, has particularly prominent veins on the dorsum of both hands. These are especially noted when her hands are in a dependent position. What is the treatment? Can they be obliterated by sclerosing solutions?

LEON J. SCHWARTZ MD Bridgeton N J

ANSWER—Prominent veins on the dorsum of the hand in young women may be due to transparent skin, absence of subcutaneous fat, poor tonus of the vessel wall, which is seen in certain constitutional types, or an abnormal rise in venous pressure. With the exception of the last mentioned possibility the condition requires no treatment and should be regarded only as a cosmetic inconvenience. The rise in venous pressure is observed in cardiac decompensation, in an obstruction of the superior vena cava and its tributaries and in certain pluri-glandular, chiefly ovarian, insufficiencies. Injections for the purpose of obliteration are not indicated.

#### AMENORRHEA FROM UNDULANT FEVER

To the Editor—What is known regarding undulant fever in young girls from 14 to 16 years of age causing cessation of the menses?

W A PHARES MD Wichita Kan

ANSWER—Protracted febrile illness, such as commonly occurs with brucellosis, may interrupt the normal sequence of the menstrual periods. Ordinarily the normal menstrual function is restored when the disease becomes inactive. Information regarding the treatment of undulant fever was given in *Queries and Minor Notes in THE JOURNAL*, February 20, page 660.

#### LIVER SPOTS

To the Editor—Will you please be kind enough to send me information on the latest treatment for liver spots?

A H LISENBY, MD Panama City Fla.

ANSWER—There is no such thing as a "liver spot." Almost any spotty pigmentation of the skin has been called by this name and on investigation has proved to be *tinea versicolor*, *chloasma*, *vitiligo*, pigmentation due to drugs and a number of other conditions. Lightly pigmented moles have been so described. A more careful description of the lesion might be helpful, but until a more accurate description is obtained treatment cannot be suggested.

#### DANGER FROM ROENTGEN RAYS

To the Editor—What effect if any will the continued operation of an x-ray machine have on the menstrual function and the female generative organs?

MD Iowa

ANSWER—If no stray radiation exists there is no danger present. The simplest way to determine this would be to use a fluorescent screen under the identical circumstances under which the work is done and if fluorescence takes place there is danger. This would have to be performed in a completely darkened room.

#### POSSIBLE EFFECT OF PROCESSING WHITE FLOUR

To the Editor—Does white flour contain substances, e.g., acids put into it during the processing which might cause stomach or other ailments in those who eat it? If so, what are those substances and what are the ailments caused by them?

MD, New York

ANSWER—White flour is bleached by treatment with a number of substances that have long been used in the milling industry. As far as available information goes, there is no evidence that the bleaching of flour by the usual methods is harmful. There is no evidence of any disease being produced by the consumption of products made from white flour per se.

#### BRUCELLA ABORTUS AS CAUSE OF PROSTATITIS

To the Editor—Under *Queries and Minor Notes* in the Dec. 18 1937 issue of THE JOURNAL there is an inquiry on the treatment of chronic prostatitis. While it is presumable that the patient has gonorrhea it would seem of importance to search for other organisms if an approved laboratory fails to identify the gonococcus on smear and culture. The inquiry states that smears show gram negative intracellular and extracellular diplococci. *Brucella abortus* is a small gram negative coccobacillus and perhaps may be confused with atypical gonococci except by the experienced laboratory worker. Therefore if culture fails to show gonococci it would be of importance to take cultures for *Brucella abortus* according to the rather involved technic necessary to grow this organism. I have seen a peculiar instance of multiple stricture in a patient with an old prostatic cured gonorrhea in whom culture of the urine and prostatic secretions yielded *Brucella abortus* with no clinical or laboratory evidence of gonorrhea. Apparently *Brucella abortus* was responsible for the occurrence of recent strictures or the exacerbation of previously existing strictures.

HAROLD J. HARRIS MD Westport N Y

Medical Examinations and Licensure

COMING EXAMINATIONS  
STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL February 19 page 599

NATIONAL BOARD OF MEDICAL EXAMINERS  
NATIONAL BOARD OF MEDICAL EXAMINERS Paris I and II Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination May 9 11 (limited to a few centers) June 20 22 and Sept 12 14 Ex Sec Mr Everett S Elwood 225 S 15th St Philadelphia

SPECIAL BOARDS  
AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country April 16 Oral examinations for Group A and B applicants will be held at San Francisco June 13 14 Sec Dr C Guy Lane 416 Marlboro St Boston  
AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates (Groups A and B) will be conducted in San Francisco June 13 14 Application for admission to Group A examination must be on file before April 1 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)  
AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13 Washington D C Oct 8 Oklahoma City Nov 15 All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination Sec Dr John Green 3720 Washington Blvd St Louis Mo  
AMERICAN BOARD OF ORTHOPAEDIC SURGERY Chicago June 10 11 Sec Dr Fremont A Chandler 6 N Michigan Ave Chicago  
AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10 11 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha  
AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY San Francisco June 11 Sec Dr Walter Freeman 1028 Connecticut Ave N W Washington D C  
AMERICAN BOARD OF RADIOLOGY San Francisco June 10 12 Sec Dr Byrl R Kirklin 102 110 Second Ave S W Rochester Minn  
AMERICAN BOARD OF UROLOGY San Francisco June 11 13 All condensed case reports must be filed by April 1 Written examination will be held in various cities in the United States and Canada April 2 Sec Dr Gilbert J Thomas 1069 Nicollet Ave Minneapolis

Oklahoma Reciprocity and Endorsement Report  
Dr James D Osborn Jr, secretary, Oklahoma State Board of Medical Examiners, reports 19 physicians licensed by reciprocity and two physicians licensed by endorsement at the meeting held in Oklahoma City, Dec 8, 1937 The following schools were represented

School	LICENSED BY RECIPROCITY	Year		Reciprocity
		Grad	with	
Bennett Medical College		(1916)	Illinois	
Loyola University School of Medicine		(1932)	Illinois	
University of Illinois College of Medicine		(1932)	Illinois	
University of Kansas School of Medicine		(1927)	Kansas	
(1930) Louisiana				
Louisiana State University Medical Center		(1936)	Louisiana	
Harvard University Medical School		(1930)	Maine	
Mcharry Medical College	(1935)	(1936 2)	Tennessee	
University of Tennessee College of Medicine	(1932)	(1933)	Mississippi	
(1933) New York	(1932 2) (1935 2) (1936 2)		Tennessee	
School	LICENSED BY ENDORSEMENT	Year		Endorsement
		Grad	of	
College of Medical Evangelists		(1937)N	B M Ex	
Harvard University Medical School		(1933)N	B M Ex	

National Board of Medical Examiners  
The National Board of Medical Examiners reports that its certificate was awarded to 101 candidates who passed the final examination held during October and November 1937 The following schools were represented

School	PASSED	Year		Number
		Grad	Passed	
College of Medical Evangelists	(1935) (1936)	(1937 6)	8	
University of Colorado School of Medicine		(1936)	1	
Yale University School of Medicine	(1934) (1935)	(1936)	3	
George Washington Univ School of Med	(1935)	(1936 2)	3	
Georgetown Univ School of Medicine	(1935 2)	(1936 10)	12	
Loyola University School of Medicine		(1937)	1	
Northwestern University Medical School		(1937)	1	
School of Medicine of the Division of the Biological Sciences		(1932)	1	
University of Louisville School of Medicine		(1936)	1	
Johns Hopkins University School of Medicine	(1934)	(1936)	2	
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935)	(1936)	2	
Boston University School of Medicine	(1935)	(1936 4)	5	
Harvard University Medical School	(1933 2) (1934) (1935 5) (1936 8)	(1932)	17	
Tufts College Medical School		(1933)	18	
(1934 2) (1935 4) (1936 11)			18	
University of Michigan Medical School		(1936)	1	
University of Minnesota Medical School		(1937 2)	2	

St Louis University School of Medicine	(1936)	1
Creighton University School of Medicine	(1936)	1
University of Nebraska College of Medicine	(1936)	1
Cornell University Medical College	(1935)	1
New York Medical College and Flower Hospital	(1936 8)	8
New York University College of Medicine	(1936)	1
Duke University School of Medicine	(1936)	1
Temple University School of Medicine	(1936)	1
University of Pennsylvania School of Medicine	(1935)	1
University of Vermont College of Medicine	(1935) (1936 2)	3
McGill University Faculty of Medicine	(1936 2)	2
Licentiate of the Royal College of Physicians of the Royal College of Surgeons Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow	(1934)	1
Universitat Bern Medizinische Fakultat	(1934)*	1

\* Verification of graduation in process

Book Notices

A Diabetic Manual for the Mutual Use of Doctor and Patient By Elliott P Joslin MD Clinical Professor of Medicine Harvard Medical School Boston Sixth edition Cloth Price \$2 Pp 219 with 49 illustrations Philadelphia Lea & Febiger 1937

The fact that this manual has reached the sixth edition speaks for its popularity There have been some additions made mainly because of the work done with protamine zinc insulin therapy in recent years Thus the material is brought down to date to help the patient to understand the problem of diabetes and also the busy physician, who can gather enough information from its pages to treat diabetes successfully The book covers the subject well and adequately for all practical purposes On page 207 there appears the statement "If the blood sugar percentage reaches 0.14 fasting or 0.170 venous blood after a meal, diabetes can be assumed to be present" This is an inaccuracy which has been apparently overlooked by the author and carried over from previous editions The light and interesting tone of the book makes it a valuable asset in the hands of a diabetic patient, who will find all the information in it, all his questions answered and thus enable him to carry on in an intelligent fashion

Martin Luthers Umwelt Charakter und Psychose sowie die Bedeutung dieser Faktoren für seine Entwicklung und Lehre Eine historisch psychiatrische Studie Von Dr med Paul J Reiter I Die Umwelt Paper Price 15 Danish kroner Pp 402 with illustrations Copenhagen Levin & Munksgaard 1937

In making a psychiatric study of a personality such as Martin Luther's, one must necessarily overcome tremendous difficulties The story of his life is more than the life history of a single person, it is also the story of his time—in Luther's case a time of chaos and conflict Luther's personality is both a historical and a psychiatric problem Paul J Reiter faced these difficulties by devoting the first volume of his work concerning Martin Luther to the "umwelt"—the environment He gives a historical analysis of the crisis in the Catholic Church, of the German theology and philosophy of Luther's time, and the sociological and political background of the sixteenth century Luther's more personal milieu provides the theme for the last part of this book and forms the transition to the second volume, which is as yet unpublished and in which the author will give a detailed psychologic analysis of Luther's personality, character and psychosis

The British Encyclopaedia of Medical Practice Including Medicine Surgery Obstetrics Gynaecology and Other Special Subjects Under the General Editorship of Sir Humphry Rolleston Bt GCVO MD Volume III Cataract to Diaphragm Diseases Cloth Price \$12 Pp 681 with 93 illustrations Volume IV Diarrhoea to Endoscopy of the Rectum Cloth Price \$12 Pp 600 with 141 illustrations London & Toronto Butterworth & Co Ltd 1937

Volumes III and IV of this latest contribution to the systems of medical practice now available are fully up to the standard of the previous volumes and present to some extent the same qualities and deficiencies As an example of the deficiencies, one may cite page 10 of volume III, which is devoted merely to four large headings that refer the reader elsewhere As an example of some of the special qualities of the work one may point to the extraordinarily fine colored illustrations of cataract and to the concise summaries of many other topics which one ordinarily does not find in such encyclopedias Thus special comment must be given to the articles on child health and on



contraception which appear in volume III and to those on diet and diseases of the ear which appear in volume IV. An unusual contribution is the article on the care of the dying by Sir Humphry Rolleston, chief editor of this series. It is only two and one-half pages in length but is a classic among medical contributions. The authors of the various articles are all leading British physicians well selected not only for their knowledge of the subjects with which they are concerned but also for their established ability to express themselves suitably in the English language.

**Shadow on the Land Syphilis** By Thomas Parran MD Surgeon General of the United States Public Health Service Cloth Price \$2.50 Pp 309 with illustrations New York Reynal & Hitchcock 1937

**Ten Million Americans Have It** By S. William Becker MS MD, Associate Professor of Dermatology and Syphilology University of Chicago Cloth Price \$1.35 Pp 220 with 8 illustrations Philadelphia New York Montreal & London J. B. Lippincott Company 1937

**Death Rides with Venus** By Arthur C. Palm Director of the Social Hygiene Foundation of Cleveland Cloth Price \$1.50 Pp 157 New York Greystone Press 1937

The books on syphilis for the public developed in response to the recent stimulated interest in this topic include the three contributions here assembled for review.

The book by Dr. Parran, called "Shadow on the Land," is obviously authentic in that it states the results of governmental investigations and in its proposal of a plan for controlling syphilis within the American system of medical practice. It is not only informative on the subject of syphilis, therefore, but also interpretative and creative. It is dignified in its approach to the subject, excellently printed and written in an easily readable style. Dr. Parran does not propose the adoption of the Swedish system, which is essentially a police control of a medical problem, but rather a controlled study of the problem as it exists in various portions of the country, with the development of suitable methods for diagnosis and treatment, utilizing the available medical facilities, which are to be enhanced by public clinics and specially created dispensaries in hospitals when these may be needed.

The book by Becker is a little too advanced for the ordinary reader but well within the scope of those of high school or college age. The concluding chapter of the book, by Becker, is an outline of the present status of our campaign against syphilis.

Arthur C. Palm, who wrote "Death Rides with Venus," is director of the Social Hygiene Foundation of Cleveland. His book is definitely written and calculated for the excitable public. It aims at dramatization by exaggeration and by the use of extraordinary language. This is particularly noticeable in the headings of the various chapters, for example, "Kill or Cure," "The Malignant Coffee Bean," "The Woman Always Pays," "Clinic or Butcher Shop" and "Sleep, Baby, Sleep."

Enough time has passed since the publication of these three books to indicate that the sensational one has attracted the least attention, deservedly, and that the reading public is quick to sense the nature of an essentially unwarranted appeal such as is made with the book entitled "Death Rides with Venus."

**Injection Treatment of Hernia** By Carl O. Rice MD FACS Instructor in Surgery University of Minnesota School of Medicine With the assistance and cooperation of Hamlin Mattson MD Cloth Price \$4.50 Pp 266 with 83 illustrations Philadelphia F. A. Davis Company 1937

This small volume reflects the experience gained by the authors in the hernia clinic of the Minneapolis General Hospital. This clinic was organized in 1932 for the purpose of trying an ambulant method of treating hernia by the injection method. The book contains chapters on the anatomy of the abdominal wall in relation to the various types of hernia, the etiology, diagnosis and differential diagnosis of hernia, and a chapter on the truss. The methods of injection for indirect inguinal hernia, direct inguinal hernia and femoral hernia are described in detail. Anatomic drawings accompanying the chapter will aid the reader much in grasping the essential points of the technique. The rationale of the treatment depends entirely on the response of the tissues to the injections of sclerosing solutions. This is adequately dealt with in a special chapter. The authors had an opportunity to observe the effects of irritating solutions in the tissues of patients at varying

intervals following injection. The histologic sections obtained from twenty-five patients demonstrated the various stages of reaction from fifteen hours to forty-two days after the injection of the irritating solution and resulting in the final reparative or scar tissue formation. The list of complications of the injection method is a formidable one. The authors display here a certain amount of partisanship, which is perhaps excusable in advocates of a new method. There is an attempt to minimize certain grave hazards. That the authors obtained 97.6 per cent cures in a series of 379 patients would be sensational enough were it not for the fact that they do not state the duration of these cures. Results of the injection therapy commented on in the editorial appearing in *THE JOURNAL*, Oct. 30, 1937, cast considerable doubt on the figures. In contrasting the results of the surgical procedure and the injection method, the authors quote Burdick and Coley to the effect that the recurrence rate after the radical operation was 16.4 per cent direct and 8.7 per cent for indirect inguinal hernia. The same authors, applying the injection method at the Hospital for Ruptured and Crippled in New York, report a relapse in 81.03 per cent of their cases. This report, however, appeared too late to come to the attention of the authors at the time of writing their book. On the whole, the subject is well presented and the pros and cons are exhaustively treated. Attention may be called to a few minor errors, which are of not much importance, to be sure, but which nevertheless do not belong in an otherwise carefully written thesis. Such are Bacunni instead of Bassini (p. 116), Anderson instead of Andrews both in the text and in the bibliography, and the following statement (p. 165): "The intravenous injection of the sodium psyllate solution will produce no systemic reactions other than the taste of soap and a tingling sensation throughout the body. This reaction persists for about five minutes. This fact has been determined by experimental evidence obtained from injection of this substance in dogs and rabbits."

**Legal Medicine and Toxicology** By Thomas A. Gonzales MD Aclm, Chief Medical Examiner of the City of New York, Morgan Vance MD Assistant Medical Examiner of the City of New York and Milton Helsen MD Assistant Medical Examiner of the City of New York. With a foreword by Harrison S. Martland MD Chief Medical Examiner Essex County (Newark) New Jersey Cloth Price \$10 Pp 754 with 411 illustrations New York & London D. Appleton Century Company Incorporated 1937

This volume is dedicated to Charles Norris and has a foreword by Harrison S. Martland. It may be promptly recognized as an authentic and practical work, condensed so as to be suitable for daily reference. It is based on the actual experience of the authors, who are medical examiners in the city of New York. After outlining the work of the medical examiner and the coroner and the legal responsibilities of the physician in relationship to various causes of death, the authors take up chapter by chapter most of the materials usually concerned in books of this character. The technique of the necropsy is given in brief with useful illustrations, many of them in color. There is then an analysis of the causes of death and of the effects of trauma on the human body, all illustrated with numerous somewhat gory and morbid cases from the authors' experience. In fact, the volume is probably the best illustrated work on this subject anywhere available. The concluding chapters are those devoted largely to toxicology. So rapidly do chemical and industrial processes proceed in our modern times that already there are several possible omissions in this section. While one finds an excellent consideration of dinitrophenol, poisoning by diethylene glycol is not included.

**Physiological Chemistry of the Bile** By Harry Sobotta Chemist to The Mount Sinai Hospital New York Cloth Price \$3 Pp 20 with 4 illustrations Baltimore Williams & Wilkins Company 1937

This monograph deals with the "biochemistry and physiology of the bile and includes a survey of the present knowledge of physiological, pharmacological and pathological facts concerning bile acids, the origin of the biliary secretion, its quantity and its composition under normal and pathological conditions. The ground covered may be indicated by the chapter headings which include the hepatic secretion, the quantity of bile secretion, the composition of the bile, modification of the bile for



by introduction of organic and inorganic compounds, the occurrence of bile acids outside the biliary tract, and the effects of bile acids. The book contains a great deal of information which will be found useful by those workers in physiology, pharmacology or experimental medicine who are interested in biliary secretion. Its interest for the more general reader, however, is lessened by the almost complete absence of chemical formulas. About one fourth of the book is devoted to the bibliography.

**A Criticism of Nursing Education with Suggestions for Constructive Reform.** By Harold Balme MD FRCS DPH. Paper. Price 75 cents. Pp 73. New York & London: Oxford University Press 1937.

Dr Balme starts out with the declaration that there is something wrong with the present system of training nurses and then proceeds to try to discover what factors are really responsible for the deplorable conditions which, to an increasing degree, discourage the better educated young women from entering the nursing profession. The answer is found in the system of training, the misuse of authority, and the rigors of a probationer's life. If the author's description is indeed a true picture of British nursing schools, improvement is urgently needed. In the United States one would have to go back forty years to find comparable conditions.

**Apes, Men and Monkeys.** By Earnest Albert Hooton. Professor of Anthropology, Harvard University. Cloth. Price \$3. Pp 307. New York: G. P. Putnam's Sons 1937.

The author, who is professor of anthropology in Harvard, has printed many of the chapters of this book as contributions to periodicals such as the *Atlantic Monthly* and the *Forum*. The contents of some of the chapters were delivered originally as lectures before various organizations. The author has a sharp tongue, a keen wit and an understanding of mankind which add light and heat to his highly scientific considerations of human beings and their reactions. The book is most suggestive of thought, highly entertaining and altogether most readable. Several of the sections are concerned with the manner in which anthropology is today integrated with medical science, some of the sections especially dealing with the likelihood of research in medicine from the anthropologic point of view. The author's description of man as a machine in contrast to the lower animals is a bitter satire on the human being. Here is a book which certainly will repay every interested reader.

**Harlow Brooks: Man and Doctor.** By John J. Moorhead MD. Cloth. Price \$3.50. Pp 302 with 8 illustrations. New York & London: Harper & Brothers Publishers 1937.

Around the career of Harlow Brooks, who died in 1936, Dr Moorhead tells the story of the development of medical practice during the past three generations. The volume is interspersed with anecdotes, with quotations from correspondence, and with intimate pictures of some of the leading practitioners of our day. Finally there is an intimate account of the last illness and death of Harlow Brooks, with a chronological table of important dates in his career and a bibliography of his writings.

**Medical State Board Examinations. Topical Summaries and Answers. An Organized Review of Actual Questions Given in Medical Licensing Examinations Throughout the United States.** By Harold Ryplins AB MD FACP. Secretary New York State Board of Medical Examiners. Third edition. Cloth. Price \$4.50. Pp 448. Philadelphia: Montreal & London: J. B. Lippincott Company 1937.

The appearance of a third edition of this work within three years indicates that it satisfies a real want. The textbook type of presentation is probably more valuable than the direct question and answer with which physicians have long been familiar. The author has successfully resisted the temptation to enlarge the scope of the work and in so doing has assured continued success in the field for which it was intended. Nevertheless there has been a careful revision of the entire work, and new chapters have been added on hypertension and arthritis. Until the states provide more general and more satisfactory arrangements for reciprocity, a work of this kind will be needed by all those who after long years of practice are compelled to undergo elementary examinations in medicine and the medical sciences.

## Miscellany

### STANDARDIZATION OF PRECORDIAL LEADS

#### Supplementary Report

The American Heart Association and the Cardiac Society of Great Britain and Ireland have recently published joint recommendations bearing upon the standardization of a single precordial lead for routine use. Many workers employ multiple precordial leads and the use of such leads is rapidly increasing. The Committee on Precordial Leads of the American Heart Association feels, therefore, that it is desirable to make recommendations with reference to leads of this type. It wishes also to make public the considerations which led to the recommendations adopted.

#### MULTIPLE PRECORDIAL LEADS

When leads from two or more precordial points are employed, it is suggested that the precordial electrode be paired either with an electrode on the left leg or with a central terminal connected through equal resistances of 5,000 or more ohms to electrodes on the right arm, left arm and left leg. It is suggested further that in the first case the letters CF<sup>1</sup> followed by a subscript and in the second case the letter V followed by a subscript be employed to designate such leads.

The position of the precordial electrode shall be indicated by the subscript used according to the following plan: Subscript 1 shall be used for the right margin of the sternum, 2 for the left margin of the sternum, 3 for a line midway between the left margin of the sternum and the left midclavicular line, 4 for the left midclavicular line, 5 for the left anterior axillary line and 6 for the left midaxillary line. When the letters and subscripts specified are employed it shall be understood that in the case of the sternal leads the precordial electrode has been placed in the fourth intercostal space and that in the case of the other leads it has been placed on a line drawn from the left sternal margin in the fourth intercostal space to the outer border of the apex beat (or to a point at the junction of the midclavicular line and the fifth intercostal space) and continued around the left side of the chest at the level of the apex beat or of the junction mentioned.<sup>2</sup>

#### EXPLANATORY REMARKS

**Size of the Precordial Electrode.**—There are at present no data on which an accurate estimate of the most desirable size for the precordial electrode can be based. Theoretical considerations suggested that until such data become available it is desirable to employ a precordial electrode no larger than is required to avoid certain technical difficulties that may arise when a very small electrode is used. The technical difficulties in question depend on polarization of the small electrode and high skin resistance when a string galvanometer is employed and involve drifting of the baseline and interference due to extrinsic alternating current when the amplifier type of electrocardiograph is used. A circular electrode 3 cm in diameter has been found satisfactory.

**Single Precordial Leads.**—The evidence at present available indicates that when a single precordial lead is used the best place for the precordial electrode is at the outer border of the cardiac apex. An apical lead appears to give reliable evidence of infarction of the anterior wall of the heart and of abnormalities of the processes on which the T wave depends more often than any other single lead from the precordium. The normal variations of the precordial electrocardiogram in apical

1 Those who prefer to place the distant electrode on the right arm may indicate its position by using the letters CR followed by a subscript. When this electrode is placed on the left arm the letters CL followed by a subscript may be used. The letters R, L and I are used as abbreviations for right arm, left arm and foot (left leg) respectively. The letter C is an abbreviation for chest. T for central terminal and V for voltage. The last (V) is used only in connection with unipolar leads in which the central terminal is the indifferent point.

2 It will be noted that lead CF<sub>4</sub> and lead IV<sub>1</sub> F (or lead CR<sub>1</sub> and lead IV<sub>1</sub> R) may sometimes be identical. In the case of the latter (lead IV<sub>1</sub> F or lead IV<sub>1</sub> R) however the precordial electrode is placed at the outer border of the cardiac apex regardless of the position of the apex with reference to the bony landmarks of the chest whereas in the case of the former (lead CF<sub>4</sub> or lead CR<sub>4</sub>) this electrode is placed in the midclavicular line even when the cardiac apex is far to the left of this position.

leads have been more thoroughly investigated than the normal variations of the precordial electrocardiogram obtained by leading from other points. The use of an apical lead has been objected to on the ground that it may be difficult for technical assistants to locate the cardiac apex. This objection applies more or less to all precordial leads. It is, perhaps, less valid in the case of sternal leads than others, but a single sternal lead is not satisfactory for the detection of infarction of the anterior or left lateral wall of the left ventricle.

Because the position of the second electrode is not always a matter of complete indifference, it was decided that it would be best to regard as permissible any of the positions of this electrode which have been specified and to devise a method of designating the one used. It was the general opinion that the committee should recommend one of the locations mentioned as the standard for routine use, but there was an almost even division of opinion as to whether the preference should be given to the right arm, for the sake of convenience in making the galvanometer connections, or to the left leg, which has been much more widely used.<sup>3</sup>

**Multiple Precordial Leads**—In certain cases of infarction of the anterior wall of the heart multiple precordial leads are required to establish the diagnosis. Such leads sometimes disclose abnormalities of the T deflection which would otherwise escape detection. In the differentiation of right from left bundle branch block, and in the differentiation of right from left ventricular enlargement, multiple precordial leads are indispensable. The series of leads particularly emphasized, although not necessarily the best that can be devised, has nevertheless been shown to be of great value and has received sufficient study to establish reasonably adequate normal standards and to establish the configuration of the changes in the ventricular complex which occur in the different leads of the series as a result of the more common cardiac abnormalities.

In the majority of cases there is no essential difference between the curves obtained when the precordial electrode is paired with an electrode on the left leg and those obtained when it is paired with a central terminal. Essential differences become increasingly common as the distance of the precordial electrode from the ventricular surface is increased.

**Method of Making the Galvanometer Connections**—In taking precordial leads the majority of workers in America have hitherto made the galvanometer connections in such a way that relative negativity of the precordial electrode was represented in the finished curve by an upward deflection. Other workers here and abroad have made the galvanometer connections in the opposite way so that relative positivity of the precordial electrode was represented by an upward deflection. It was thought imperative that one or the other method be declared standard. After a great deal of discussion it was decided that the temporary inconvenience to the large number who have become accustomed to the first method would be more than overbalanced by the advantages offered by the second.<sup>4</sup>

3 There is some evidence suggesting that a comparison of lead IV B and lead IV F may be useful in the diagnosis of acute pericarditis and of myocardial infarction involving both the anterior and the posterior walls of the left ventricle. Lead IV T seems to be as satisfactory as any of the other apical leads. Compared to the leads in which the apical electrode is paired with a single electrode in the back or on one of the extremities it is much more nearly unipolar, i. e. it records the potential variations of the precordial electrode without distortion (or with minimal distortion) due to potential variations of the distant electrode. Whether this will prove to be an important advantage from a practical standpoint is as yet uncertain. This lead has the disadvantage that it requires special equipment and is less convenient to use than lead IV F or lead IV R. Lead IV L is the most convenient of all since after lead III has been taken a single operation (the transfer of the left leg wire to the apical electrode) is required to obtain it. It has however been so little used that it cannot be recommended without reserve at this time. The relative merits of these different leads is in need of thorough investigation. The following relations between them may be pointed out:

$$\begin{aligned}\text{Lead IV R} &= \text{Lead IV F} + \text{Lead II} \\ \text{Lead IV L} &= \text{Lead IV F} + \text{Lead III} \\ \text{Lead IV T} &= \text{Lead IV F} + \frac{1}{4} (\text{Lead II} + \text{Lead III})\end{aligned}$$

These equations are analogous to Einthoven's equation which states that  $\text{Lead II} = \text{Lead I} + \text{Lead III}$ .

4 To make the galvanometer connections in such a way that positivity of the precordial electrode will produce an upward deflection in the finished record it is necessary to connect the left hand wire to this electrode if the lead switch is on lead I and to connect the left leg wire to this electrode if the lead switch is on lead II or lead III. To take the lead IV F connect the left leg wire to the precordial electrode and the left arm wire to the left leg electrode and place the lead switch on lead III. To take lead IV R connect the left leg wire to the precordial electrode and the right arm wire to the right arm electrode and place the lead switch on lead II.

The advantages of making the galvanometer connections in such a way that relative positivity of the precordial electrode is represented in the finished curve by an upward deflection and relative negativity of this electrode by a downward deflection are as follows:

1 This method makes it possible to assign the letters Q, R and S to the individual deflections of the QRS group in exactly the same manner as in the case of the standard limb leads, without violating the general principle that, as far as possible, deflections which have the same origin or the same significance should invariably bear the same name. In particular, it makes it possible always to assign the same letter (R) to the onset of the intrinsic deflection, which signals the arrival of the impulse at the epicardial surface of the portion of the heart subjacent to the precordial electrode, without departing from the customary method of labeling the QRS deflections.

2 In cases of infarction of the anterior wall of the heart this method yields ventricular complexes characterized by abnormally large initial downward deflections (Q waves) and sharply inverted T waves of the "cove plane" or "coronary type." These complexes are practically identical with those which have long been considered characteristic of myocardial infarction in the case of the standard leads, and they may be described in the same terms.

3 The P deflections and T deflections are normally upright. There are great advantages, particularly from the standpoint of one who is teaching electrocardiography or of one who is beginning the study of this subject, in a system which makes upright T waves invariably normal, whatever the lead.

4 The use of the terms plus and minus and of the symbols + and - is greatly simplified. In the case of precordial leads one electrode, the precordial electrode, is much more important than the other. In the discussion of the principles on which the interpretation of the precordial electrocardiogram rests it is necessary to refer frequently to the potential of the precordial electrode and in connection therewith to employ the terms and symbols mentioned. Since it is customary to speak of downward deflections as negative and to prefix measurements of such deflections with the minus sign, much confusion and misunderstanding will be avoided if the deflection of the trace is upward when the potential of the precordial electrode is positive and downward when the potential of this electrode is negative.

**Nomenclature**—For the convenience of those who wish to make statistical studies of the QRS group, to measure and tabulate the QRS deflections or to classify or characterize QRS deflections of different types, it is imperative that the individual deflections of the QRS group be designated by distinct symbols, even though the naming of these deflections may involve the application of rules that are more or less arbitrary.

The adoption in the case of precordial leads of symbols different from those employed in the case of the standard leads might have some advantages. It would, however, have at the same time tremendous disadvantages. It would add an entirely new terminology to clinical electrocardiography, which is already regarded by many as an abstruse and incomprehensible subject, and would greatly increase the number of technical terms that beginners in this field would have to learn. It would invite other attempts to improve on electrocardiographic terminology and would stand little chance of prompt and universal acceptance. The adoption of new symbols for the initial ventricular deflections would also greatly complicate the use of such terms as the P-R interval, the QRS interval, the RS-T segment and RS-T displacement, which could not then logically be used with reference to precordial leads. For these reasons it was decided that the deflections of precordial leads should be designated by the same letters as those of standard limb leads.

#### COMMENT

In making the recommendations adopted it has been our purpose to simplify the use of precordial leads for those who desire to employ them in everyday clinical work and to reduce the confusion that exists at present because of a lack of uniformity and precision in current technique and nomenclature.

Our discussions have made us acutely aware of many gaps in our knowledge of the precordial electrocardiogram which must be filled in by future investigation. We feel that it would be unfortunate if our attempt to standardize precordial leads should discourage the investigation of leads of any kind whatsoever.

ARLIE R. BARNES  
HAROLD E. B. PARDEE  
PAUL D. WHITE  
FRANK N. WILSON  
CHARLES C. WOLFERTH

COMMITTEE OF THE AMERICAN HEART  
ASSOCIATION FOR THE STANDARDIZATION  
OF PRECORDIAL LEADS

### AN END MATTRESS

An end mattress which is entirely separate from the regular bed mattress, and designed to be placed at the foot of a bed, being attached to the foot bed piece by tapes, has been perfected and patented by Elizabeth M. Tottenham of Brownwood, Texas. The purpose of the end mattress is to protect the patient's feet and legs from the weight of bed covers, especially in cases of burns of the leg and cases of leg and foot operations, and fractures. There are metal islets in the end mattress from which hot water bottles may be hung and thus provide warmth without the patient's limbs coming in contact with the hot water bottles. The end mattress has about the same shape and the same vertical and transverse dimensions as that part of the bed foot-frame which extends above the mattress proper, it is adapted to rest on, but is unattached to, the foot end-portion of the bed mattress proper. The bed covers may be made over the end mattress and over the foot of the bed. Being taped to the bed, it will not collapse as does a pillow when used for similar purposes. The end mattress will also be useful in orthopedic cases when it is necessary to use extension or pulley over the end of the bed and will assist in preventing foot drop. Mrs. Tottenham, the inventor, is the wife of Dr. J. W. Tottenham and also a member of the executive board of the Texas State Woman's Auxiliary.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Life Insurance Malignant Tumor of Lungs Secondary to Hypernephroma of Kidney**—The defendant insurance company issued a policy of life insurance to Crocker in December 1935 which provided that it should be void if, "upon its date and delivery, the insured be not alive and in sound health." The insured died on April 1, 1936, from a malignant tumor of the lungs, variously described in the record as cancer, carcinoma and hypernephroma. Crocker's beneficiary brought suit against the insurance company on its refusal to pay the benefits provided in the policy. From a judgment in favor of the beneficiary, the insurance company appealed to the Supreme Court of South Carolina.

The insurance company denied liability on the ground that the insured was not in good health when the policy was issued, in September 1935, because at that time he was suffering from a malignant tumor of the lungs. The evidence in the case showed that in January 1935 Crocker underwent an operation for the removal of his left kidney because of a malignant tumor of that organ, also variously described in the record as cancer, carcinoma and hypernephroma. The evidence also showed that in the early part of September 1935 he appeared weak, emaciated, had a bad color and suffered from pulmonary embarrassment. The physician who had removed the insured's left kidney and a physician connected with the veterans' hospital where he died testified that the malignant tumor of the lungs, which caused the insured's death, was a metastatic

tumor secondary to the hypernephroma of the kidney. Both medical witnesses testified that metastasis to the lungs had occurred prior to the issuance of the insurance policy. The latter witness testified that the "cause of death was carcinoma of the lung or hypernephroma secondary to hypernephroma of the left kidney" and that "the secondary condition of the lung existed at the time of the operation for the removal of the kidney without a doubt, as the lung pathology is secondary to the kidney, and if the tumor was removed, as it was at the operation, the metastasis must have been or had to be there to be in the lung at the time of his death." Two other medical witnesses, who had neither examined nor attended the insured, testified that the malignant tumor of the lungs was, or in all probability was, due to a metastasis of the malignant tumor of the kidney. They admitted, however, that there was a possibility that the tumor of the lungs was primary, that is, it had developed independently of the tumor in the kidney. One of these two witnesses testified that such possibility would not be suspected and that one "would be right in saying it came from the kidney nearly every time."

From the foregoing testimony, said the Supreme Court of South Carolina, it is seen that the medical witnesses who had examined and attended the insured at different times between January 1935 and April 1936 were in a position to express the better opinion as to the cause of the insured's death, and their testimony was to the positive effect that the malignant tumor of the lungs was secondary to the hypernephroma of the kidney. In the opinion of the court, there was no evidence from which the jury could reasonably infer that the insured's lung trouble could have been primary. Expressions of opinion as to possibilities are nothing more, at best, than speculative and hypothetical views. The court concluded without hesitation that the only reasonable inference to be drawn from the evidence was that the insured was not in sound health, within the meaning of the insurance policy, at the time the policy was delivered to him. Accordingly, the judgment for the beneficiary was reversed and the case remanded with instructions to enter judgment for the defendant.—*Crocker v Life Ins Co of Virginia (S C)*, 191 S E 312.

**Chiropractic Death of Patient from Cerebral Hemorrhage Following Treatment**—This case involves the liability of a chiropractor for the death of his patient from cerebral hemorrhage following a manipulation of the patient's spine. The trial court found for the administrator of the patient's estate in the amount of \$6,000 and the case eventually came before the Supreme Judicial Court of Massachusetts.

The evidence most favorable to the plaintiff's contention, the court said, indicated that the defendant had treated the patient for about one and a half years previous to her death for high blood pressure. The defendant, incidentally, was not licensed to practice healing in Massachusetts and was thereafter found guilty of unlawfully holding himself out as a practitioner of medicine. On Dec 27, 1934, the patient left her place of employment around 4:30 in the afternoon, sober, entirely rational and in good spirits. She walked to the defendant's office about a mile distant, arriving there between 5 and 5:30. About half an hour later the defendant administered treatment to her for her blood pressure by manipulating and massaging her spine. Between 6 and 7 o'clock the patient became ill but not unconscious. She became nauseated and lost control of urine and feces. She asked to be allowed to lie down and rest, to be let alone, and requested that "her people" be called, naming particularly one of her sisters. Her sisters, however, received no word with respect to her condition until several hours later and when they arrived at the defendant's office they were told by the defendant and his assistant that the patient was merely "dead drunk." Eventually the patient was removed to a hospital where she died the second day thereafter as a result of a cerebral hemorrhage that occurred in the defendant's office.

The chiropractor contended that the plaintiff failed to establish the time when such treatment as he administered to the patient was given, that is, failed to establish whether it was given before or after the patient became ill. On this particular issue there was no testimonial evidence other than that of the defendant and he denied on the witness stand that any treatment at all had been administered to the patient on the day in ques-

tion The other evidence, the court said, must be considered and examined for any possibility of proper and material inferences that the treatment occurred prior to the hemorrhage suffered by the patient The intermediate appellate court drew such an inference from the evidence of the disrobed state of the patient when the attendant nurse returned to the defendant's office about 7 o'clock, coupled with the improbability that manipulation would have been attempted on a patient verging on a collapse In the opinion of the Supreme Judicial Court, the court below warrantably could have found that the testimony of the defendant that he did not treat the patient on the day in question was intentionally and knowingly false both as to the occurrence of a treatment and as to the time of that treatment The medical testimony, the court continued, warranted a finding that chiropractic treatment such as the defendant used could cause a patient with high blood pressure to have such a hemorrhage The defendant objected to this testimony on two grounds (1) that both the experts who testified admitted that they were not familiar with the chiropractic system of treatment and (2) that they agreed that the hemorrhage could have been induced in some other way The defendant, however, made no contention that the medical witnesses were unfamiliar with the general aspects of the chiropractic system or with its effect on the body of a "hypertension patient," or that their testimony was not based on their knowledge of the effect of such treatment Testimony that even slight pressure could have caused the hemorrhage, supplemented by the defendant's admission to the police officer that he had treated the patient by "manipulation of the spine and massage" on December 27, and the trial judge's own observation of the defendant's method of practice during a demonstration carried on in the court room, constituted, in the opinion of the Supreme Judicial Court, a sufficient basis on which to rest a finding of causation The defendant admitted that his school of chiropractic advocated refusal to "take on patients with that ailment [high blood pressure] because it is too dangerous" This fact in connection with other facts, said the court, warranted a finding that the treatment administered by the defendant was negligent

The judgment of the intermediate appellate court affirming, in effect, the judgment of the trial court for the plaintiff was affirmed—*Deward v Whitney (Mass)*, 9 N E (2d) 369

**Malpractice Sponge Left in Patient, Liability of Anesthetist**—The plaintiff suffered from an acute attack of obstruction of the gallbladder duct and his attending physician advised an operation Two surgeons were consulted and agreed to perform the operation, the attending physician acting as anesthetist During the course of the operation, the plaintiff passed into a state of shock As speedily as possible, drainage tubes were inserted, the incision sutured and restoratives to bring him out of shock were successfully applied After a stay in the hospital of about twenty days, the plaintiff returned to his home The operation wound did not heal and the plaintiff continued to suffer pain Finally, another physician discovered a piece of gauze protruding from the wound, which was removed In a short time the discharge from the wound abated and the wound healed Thereafter the plaintiff sued the hospital, the attending physician and the two surgeons who operated on him A verdict was directed in favor of the hospital but verdicts were rendered against the three physicians and they appealed to the Supreme Court of Minnesota

The trial court erred, said the Supreme Court, in denying the motion of the attending physician for a directed verdict The evidence was undisputed that the attending physician advised the plaintiff to go to the hospital for an operation but there was no intimation that he expressly contracted to cause it to be performed It was taken for granted that the surgeons were to perform the operation and that the attending physician would administer the anesthetic There was no evidence of a joint employment of the three physicians The anesthetist must give close attention to the patient, so as to keep him continually unconscious, yet short of endangering life It was to the court unthinkable that the anesthetist should explore the wound to see whether the sponges or packs had been removed before the incision was closed

With respect to the two surgeons, they both virtually admitted on the witness stand that the sponge was inserted by them and should have been removed but was not Each claimed, however, that the trial court erred when it charged the jury as follows

Now the burden of proof is on the defendants in this case to establish their claims that they were warranted and excusable in not having removed the gauze at the time in question This they must sustain by a fair preponderance of the evidence

Standing alone, said the Supreme Court, the two quoted sentences are not technically correct The burden was on the plaintiff to show that the gauze pack remained in his body because of the defendants' negligence All the authorities hold that the finding of a pack or gauze sponge, or any other foreign substance not inserted for drainage purpose, in the incision made in an operation, is evidence which bears on the issue of proper care of the operating surgeon In the trial of a case the proof introduced by the plaintiff or admissions made by the defendant may bring the evidence to a point where the defendant's negligence stands established unless he comes forward with proof which excuses or acquits him of negligence In the present case, the surgeons admitted that the pack was used by them, that it was not, but should have been, removed, that it was not left there for drainage purposes, and, in short that their duty was to remove it before closing the incision The evidence standing thus, the defendants went forward with proof that an unusually unfavorable condition was found when the body was opened and that before this could be thoroughly explored the patient went into shock, forcing a hurried termination of the operation Under the circumstances here present, the court said, where the defendants apparently realized that the plaintiff's case called on them to prove some ground or excuse for failure to remove the pack, it cannot be said that the instruction, though faulty, was prejudicial In the opinion of the court, the record justified an implication of negligence on the part of the surgeons in leaving the sponge in the patient's abdomen

The case was therefore remanded to the trial court with instruction to enter judgment in favor of the attending physician The judgments against the operating surgeons were affirmed—*Brossard v Koop (Minn)*, 274 N W 241

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of, Mobile, Apr 19 21 Dr D L Cannon 519 Dexter Ave Montgomery Secretary
- American Association for Thoracic Surgery Atlanta, Ga Apr 46 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary
- American Association of Anatomists Pittsburgh Apr 14 16 Dr Geo. E W Corner 260 Crittenden Blvd Rochester N Y Secretary
- American Association on Mental Deficiency Richmond Va Apr 20-23 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary
- American College of Physicians New York Apr 48 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary
- American Physiological Society Baltimore Mar 30 Apr 2 Dr A C Ivy 303 East Chicago Ave, Chicago Secretary
- American Society for Experimental Pathology Baltimore Mar 30 Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary
- American Society for Pharmacology and Experimental Therapeutics Baltimore Mar 30 Apr 2 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary
- American Society of Biological Chemists Baltimore Mar 30-Apr 2 Dr H A Mattill Chemistry Bldg State University of Iowa Iowa City Secretary
- American Therapeutic Society New York Apr 12 Dr Ocar B Hunter 1835 Eye St N W Washington D C Secretary
- Arizona State Medical Association Tucson Apr 21 23 Dr D F Harbridge 15 East Monroe St Phoenix Secretary
- Arkansas Medical Society Texarkana Apr 18 20 Dr W R Brock 602 Garrison Ave Ft Smith Secretary
- Federation of American Societies for Experimental Biology Baltimore Mar 30-Apr 2 Dr D R Hoover 19 West Chas St Baltimore Secretary
- Mississippi State Medical Association Jackson Apr 19 21 Dr T V Dye McWilliams Bldg Clarksdale Secretary
- Philippine Islands Medical Association Zamboanga City Apr 19 22 Dr A S Fernando 817 Taft Ave Manila Secretary
- Southeastern Surgical Congress Louisville Ky March 7 9 Dr I T Beasley 701 Hurt Bldg Atlanta Ga Secretary
- Tennessee State Medical Association Nashville Apr 12 14 Dr H H Shoulders 706 Church St Nashville Secretary

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

Tenth Annual Meeting Held in Chicago Nov 5 and 6 1937

The President, DR DAVID P BARR, St Louis, in the Chair

(Continued from page 604)

### Iron Transportation and Metabolism IV Absorption of Iron from the Gastro-Intestinal Tract and Its Disappearance from the Blood Stream

DRS CARL V MOORE and WILLIAM R ARROWSMITH, Columbus, Ohio With the demonstration that iron is transported in the blood stream as serum iron, a new technic for studying iron absorption from the gastro-intestinal tract and the rate of disappearance of the absorbed iron from the blood stream has become available. It has been shown that a significant transient increase in serum iron values to from three to ten times the basal level occurs following the oral administration of a single large dose of various iron salts. In the present study the heights of the serum iron responses to graded individual doses of several of the commonly used iron salts have been observed in normal subjects and in patients with histamine refractory achlorhydria. In the latter subjects the effect of giving dilute hydrochloric acid with the iron has likewise been noted. When iron is injected directly into the blood stream, all the injected iron is present in the serum fraction. Standard amounts of iron salts, both ferrous and ferric, simple and combined, have been given intravenously to laboratory animals, and the rate of their disappearance from the blood stream has been determined. From these observations the fundamental mechanism involved in these phases of iron metabolism becomes more clearly apparent.

#### DISCUSSION

DR CLARENCE F G BROWN, Chicago Fifteen years ago it was thought that iron was not absorbed through the gastro-intestinal tract when taken by mouth. Since that time many changes have taken place. It has been recognized by the authors that iron is irritating to stomach and bowel. Perhaps many hemorrhages in ulcer patients that occur three or four weeks after the patient leaves the hospital are due to misguided efforts in building up the patient.

DR ADOLPH SACHS, Omaha Is the absorption of iron variable in a patient over a long period of time provided the patient has sufficient hydrochloric acid? Has Dr Moore come to any further conclusion as to the value of this easily split-off iron?

DR CARL V MOORE, Columbus, Ohio We are not prepared at present to answer Dr Sachs's first question. In several subjects with normal gastric acidity we have determined the serum iron response to the same dose of the same iron salt on each of three different days. In one instance these three periods of observation fell within a ten day period, in two other cases they were spaced at intervals of approximately three weeks. The heights to which the serum iron values rose in these instances varied from 20 to 30 per cent. We have not as yet observed subjects in this manner for longer periods. I have nothing further to add regarding the physiologic significance of "easily split-off" iron. It is interesting to note, however, that Barkan has recently withdrawn from his previous position that "easily split off" iron has to do with the function of iron transportation and now considers it to be a pseudohemoglobin, possibly an intermediary stage in the breakdown of hemoglobin to bile pigment.

### Bilateral Carotid Sinus Denervation Two Cases, with Observations on the Vascular Reflexes

DRS RICHARD B CAPPS and GEZA DE TAKATS, Chicago Observations of the vascular reflexes in patients who have undergone a bilateral carotid sinus denervation have not been reported previously in this country. Two such patients are the subject of this report. Studies were made particularly of the cardiovascular reaction to carotid sinus stimulation obliteration and release of the common carotid low in the neck, changes in posture, eyeball pressure and exercise. It was concluded that in man there are other vascular regions capable of taking over the normal physiologic functions of the carotid

sinus in a reasonably satisfactory manner. There developed, however, a definite postural hypotension, which persisted for seventeen and eight and one-half months, respectively.

#### DISCUSSION

DR WINCHELL MCK. CRAIG, Rochester, Minn Any surgical procedure carried out for the first time on the central, or autonomic, nervous system is necessarily approached with a certain amount of apprehension. Dr H L Smith and I, in an attempt to relieve patients afflicted with the carotid sinus syndrome, have come to believe that in severe cases in which there is no response to conservative treatment the carotid sinus should be denervated in a manner similar to that employed by Drs Capps and de Takats. We have operated (unilateral carotid sinus denervation) in eleven severe cases of carotid sinus syncope and in only one instance was it necessary to denervate the sinus on both sides. In this one case the attacks were reduced practically 50 per cent following denervation of one carotid sinus and have been completely relieved, to date, following operation on the opposite side. Naturally, the second denervation was done with a great deal of interest and the results were satisfactory, in view of the fact that no significant change in blood pressure has been noted.

DR L N KATZ, Chicago In denervating the carotid sinus in deeply anesthetized dogs, Drs Witt, Kohn and I found that many of the dogs died from respiratory failure. This possibility should be borne in mind in operations in this region in man and special care should be taken in administering the anesthetic.

DR GEZA DE TAKATS, Chicago So far we have done five carotid sinus unilateral denervations and only two on both sides. Regarding Dr Katz's remarks, the blood pressure records of these patients during operation indicate that the area should be thoroughly infiltrated with procaine hydrochloride. It was a great surprise to find this postural hypotension. In one patient it was so severe as to emphasize that ordinarily one should not interfere with this important mechanism. Dr Capps did not have time to say that he studied twenty-five patients with hyperactive carotid sinus reflexes and we found it necessary to do the operation in only five cases.

### Influence of Thyroid on Blood Pressure

DR WILLIAM B KOUNTZ, St Louis Occasional observations of beneficial influence of thyroid medication on the hypertension sometimes observed in myxedema have been reported. These observations led to a consideration of the effect of thyroid on individuals with pathologically elevated blood pressures. One hundred cases of hypertension without primary nephritis were studied with thyroid therapy under controlled conditions for a period of twelve months. Of these, fifteen without signs of clinical myxedema showed improvement with thyroid therapy. Further analysis led to recognition of a group of hypertensive patients with distinctive clinical characteristics other than their favorable response to the effects of thyroid medication.

#### DISCUSSION

DR A R BARNES, Rochester, Minn This is a new observation to me. Did the patients, at the time their blood pressure had fallen, have basal rates that were above normal? It is interesting to speculate how this observation fits in with some things that are known about the relation of blood pressure to the hyperthyroid state. In a case of exophthalmic goiter, for example, one anticipates some increase in the systolic blood pressure, which may rise to as much as 160 or 180 mm of mercury, but the diastolic pressure is inclined to fall, resulting in an increase in pulse pressure. This may be considered a more or less normal reaction to hyperthyroidism. Relief of the hyperthyroidism commonly restores the blood pressure to normal. When hyperthyroidism complicates essential hypertension, the blood pressure may decrease, particularly the diastolic pressure. It is customary to consider this evidence of peripheral vasodilatation to be related to the hyperthyroidism. When the hyperthyroidism of such a patient is relieved by operation, frequently the blood pressure rises again and remains high. How that reaction fits in with the observations made by Dr Kountz is not clear.

DR WILLIAM B KOUNTZ St Louis An attempt was made to keep the patients from becoming thyrotoxic There is no doubt that most of them did show at one time or another some degree of thyrotoxicosis These patients did not respond to thyroid with much increase in heart rate Possibly the heart is not stimulated by administration of thyroid substance, but there is more of a vasomotor response I have seen some of the patients referred to by Dr Barnes There are many factors concerned For instance, if the heart is diseased, the anesthesia and the thyroidectomy may also influence what happens to the general blood pressure of the individual When this occurs it is probably a vasomotor effect

#### Experimental Hypertension Constriction of the Aorta at Various Levels

DRS HARRY GOLDBLATT and JOSEPH R KAHN, Cleveland By means of a special clamp the aorta of dogs was permanently constricted at various levels Constriction immediately above both renal arteries was followed by the development of persistent hypertension above (carotid) and hypotension below (femoral) the clamp The hypertensive effect began within a few hours after the clamping, the hypotensive effect was immediate Constriction of the aorta immediately below both renal arteries was not followed by the development of persistent hypertension These results agree with those of previous studies on the hypertensive effect of constriction of the main renal arteries The method affords an opportunity to study the effect of hypertension and hypotension on the blood vessels of the same animal

#### Occlusive Arterial Disease of the Lower Extremities with Lipemia and Xanthomatosis

DR NELSON W BARKER, Rochester, Minn Two patients in the fifth decade have been studied in relation to the combination of occlusive arterial disease of the lower extremities and xanthoma multiplex with lipemia but without evidence of diabetes mellitus Values for blood cholesterol exceeded 600 mg per hundred cubic centimeters in each case on admission, this being more than double the upper limit for blood cholesterol found in a series of cases of thrombo-angitis obliterans and arteriosclerosis obliterans The presence of the vascular disease suggests a premature atheromatosis It was possible to reduce the lipemia significantly by low fat diets over a period of time

#### DISCUSSION

DR CHARLES A DOAN, Columbus, Ohio Did the differential leukocyte count in these patients show any increase in monocyte elements in association with the altered fatty acid metabolism, as has been described in tuberculosis and the xanthomatoses? Also were replacement or exsanguination transfusion used in addition to a low diet as a means of lowering the serum lipids? I have found the former method the most dependable in controlling the tendency to excessive plasma lipids, with corresponding clinical improvement and diminution in blood monocytes

DR NELSON W BARKER, Rochester, Minn The differential leukocyte counts in these two patients were normal No significant increase in monocytes was noted Treatment by exsanguination and transfusion was not considered in our cases It seems necessary to consider that patients with lipemia and occlusive vascular disease in any part of the body have a serious condition There is sufficient evidence that the lipemia is related to the production of vascular lesions in these cases, so that strenuous attempts should be made to reduce the lipemia

#### Cold Pressor Test in Pregnancy

DRS WILLIAM J DIECKMANN, HERBERT L MICHEL and PAUL W WOODRUFF, Chicago The ice water test for vasomotor lability has been used by us since 1933 We stated in a previous report that the test seemed to be of value in aiding us to detect those pregnant patients who have a primary hypertension One hundred and fifty-two normal pregnant patients were subjected to the test in early pregnancy Ninety patients with the test gave an increase in the systolic blood pressure of 30 mm. or more and fifteen of these subsequently showed evidence of toxemia Thirty-two gave a rise of from 20 to 29 mm and one of these developed toxemia Thirty showed

an increase of from 0 to 19 mm and one of these developed toxemia The cold pressor test seems to be of value in enabling one, early in pregnancy, to detect those patients who may develop toxemia It has also been used by us and others as a test to determine whether or not a patient who had toxemia in a previous pregnancy might have a recurrence if she again became pregnant

#### DISCUSSION

DR HAROLD C LUETH, Chicago What care was taken in immersing the hand in cold water? In some studies on unusual reactions to glyceryl trinitrate I used the same test but found that it depended on a number of factors, mechanical and psychologic When great care was taken in bringing the basin of cold water to the patient's hand and passively immersing and withdrawing his hand from the water, these objections were largely overcome This procedure also materially reduced the pressor effect of the test

DR L N KATZ, Chicago Can Dr Dieckmann tell with what degree of accuracy he could predict the future course of pregnancy patients with the cold pressor and with the pitressin tests?

DR A R MCINTYRE, Omaha How did the pulse react when the cold pressure test was performed, and how did the diastolic pressure compare to the systolic pressure?

DR HERBERT L MICHEL, Chicago So far as the test with solution of posterior pituitary is concerned, we were able to confirm a diagnosis of toxemia of pregnancy in every patient in whom a diagnosis of toxemia of pregnancy had been made Patients in whom a diagnosis of essential hypertension or vascular-renal disease had been made reacted to injections of solution of posterior pituitary by a rise in blood pressure of not more than 11 mm., as compared to a rise of 52 mm in the former group Thus the test served to confirm diagnosis rather than predict toxemia of pregnancy With the cold pressor test those patients who already had toxemia of pregnancy gave minor response to the test, whereas those with essential hypertension and vascular renal disease gave definite responses to the test Furthermore, patients with a family history of hypertension but with normal blood pressure at the time of the test gave marked responses to ice water stimulation Thirty per cent of the patients in the early months of pregnancy who had normal blood pressure at the time of the test and showed excessive responses developed toxemia of pregnancy, whereas of the group that did not give normal response to the cold pressure test only two patients developed toxemia of pregnancy Since blood pressure is so easily affected by external influences, we submitted the patients to no other manipulations other than what was definitely concerned with the blood pressure responses All extraneous noises and manipulations were reduced to a minimum Only one person presided over the test In many instances the self recording sphygmomanometer was used, so that the operator was as far away from the patient as was feasible for the test The diastolic pressure responded in the same manner as the systolic pressure, the rise, however, was rarely as great in actual millimeters

#### Histaminase in Hypersensitivity to Cold

GRACE M ROTH, PH D, and DR BAYARD T HORTON, Rochester, Minn In 1928 Horton and Brown presented before this society a clinical syndrome called "cold allergy" They suspected the liberation of a histamine-like substance to be the etiologic factor in the syndrome Two years later Best and McHenry reported the destruction of histamine in the bodies of animals by an enzyme which they called "histaminase." Histaminase was not available for clinical purposes until the past year If the liberation of histamine or a histamine like substance in excessive amounts was the etiologic factor in cold allergy or in 'hypersensitivity to cold,' as this syndrome was later called, histaminase should be effective as a method of treatment in this condition Histaminase has been effective in a series of subjects with hypersensitivity to cold Additional clinical studies indicate a wider field of usefulness for this drug

#### DISCUSSION

DR BAYARD T HORTON, Rochester, Minn This work offers additional evidence that the syndrome "hypersensitivity to cold" is produced by liberation of histamine or a histamine



like substance from the skin and subcutaneous tissue and not only that liberation of this substance produces a local reaction but also, if in sufficient quantities, some will be absorbed into the blood and therefore produce the well known systemic reaction that has been described previously. Response of the gastric acids following exposure to cold is identical with that produced by subcutaneous injection of histamine. This gives an accurate estimate of the amount of histamine-like substance which is liberated in tissues following exposure to cold. Following administration of histaminase by mouth, it has been demonstrated that there is a definite decrease in rise of gastric acidity following exposure to cold, and therefore this reaction is an index as to its usefulness in treatment of this type of condition. It should be kept in mind, however, that there are many types of conditions which are masquerading under the term 'hypersensitiveness to cold' which actually do not belong in this category at all. This definite clinical entity should not be confused with other bizarre clinical symptoms which have little or nothing in common. Good clinical results have been obtained in treatment of patients who have a hypersensitiveness to cold. As to what results one can hope to obtain in less clearly defined cases of so called hypersensitiveness to cold is not known. It is possible that in treatment of subjects who are hypersensitive to cold one is dealing with a type of deficiency disease, but there is no particular proof of this at present.

DR E H RINEARSON, Rochester, Minn. I became interested in using this substance for the treatment of skin reactions to protamine zinc insulin. Protamine zinc insulin is a valuable adjunct in the treatment of diabetes, but it has carried with it certain disadvantages. One of these is the fact that there has been an increase in the local skin reactions, some of which have been large, red, tender, and of many days' duration. I have tried injecting protamine more deeply, have tried local massage at the site of injection and have injected a few drops intradermally as is done in Germany, all to no avail. Recently I have tried histaminase by mouth in one case and histamine injections in another. Both patients have lost their sensitivity to protamine zinc insulin. It is, of course, too early to evaluate the use of histamine and histaminase in the treatment of this condition, but attention is called to it with the hope that others may be interested in giving it a clinical trial.

DR FREDERICK H SCHARLES, Kansas City, Mo. Has histaminase been tried in chronic urticaria?

DR CLARENCE BERNSTEIN JR, Chicago. It seems that the histaminase must be stronger or the cold more severe in Rochester than in Chicago. I used histaminase for one patient who had cold urticaria without appreciable result, and in one other case used antuitrin-S with considerable beneficial effect. Have any other types of treatment been used in these or similar cases for control observations?

DR LOUIS LEITER, Chicago. It would be interesting to try out the effect of histaminase on typical anaphylactic shock in the dog in view of the decisive experiments of Dragstedt on the relationship between histamine and experimental canine anaphylaxis. If histaminase is really effective in human anaphylactic states, it should be possible to demonstrate its action on the dog.

DR GRACE M ROTH, Rochester, Minn. We have confined the work with histaminase to patients hypersensitive to cold, and we did very little work with giant urticaria.

#### Extremities in the Exchanges of Energy Between the Normal Human Body and Its Environment

CHARLES SHEARD, PH D, MARVIN WILLIAMS, PH D, and DR BAYARD T HORTON, Rochester, Minn. Three psychometric rooms have been used, equipped with apparatus capable of maintaining the environmental temperature within  $\pm 1$  degree Fahrenheit and the relative humidity within  $\pm 3$  per cent, and with a possible range of temperatures of from 60 to 100 F and of relative humidities from 30 to 80 per cent. The temperatures of various regions of the skin have been determined by means of thermocouples in a galvanometric circuit so arranged as to permit of obtaining skin temperatures very rapidly and with an accuracy of 0.2 degree centigrade (approximately 0.5 degree Fahrenheit). Experimental data are presented on (1) the role of the extremities in the dissipation of

heat from the body in order that the loss of heat may equal the production of heat, the internal temperature of the body remaining constant, (2) the influence of changes of environment on the temperatures of the skin in various areas in normal individuals in the basal state, (3) the effects of the ingestion of food and the subsequent regulation of the dissipation of the increased production of heat by the extremities under varied but controlled environmental conditions, (4) the relative functions of the upper and lower extremities, respectively, in the control of loss of heat from the body in the basal state and following the ingestion of food within the range of environmental temperatures of from 65 to 80 F (18 to 26.5 C), (5) the approximately linear relationship between the basal metabolic rate in normal individuals and the temperatures of the toes under an environmental temperature of 77 F (25 C) and 40 per cent relative humidity, (6) the significance of the deductions concerning the function of vasoconstriction and the application of the experimental procedures to the study of normal vasoconstriction and peripheral vascular deficiencies.

#### DISCUSSION

DR BAYARD T HORTON, Rochester, Minn. Apparently it does not make any difference whether the meal given was free of protein or high in content of protein, the same reactions occurred in the hands and feet. That is, following ingestion of a meal there was a sharp rise in the surface temperature of the hands and feet and essentially the same increase in surface temperature occurred following taking the meal as that which occurred following injection of intravenous typhoid vaccine or taking ethyl alcohol by mouth. The other point is concerning the vasomotor gradient. All slides which Dr Sheard has shown illustrate clearly that there is a vasomotor gradient between the face, hands and feet regardless of the agent used to produce vasodilatation, whether it was taking a meal, application of heat, intravenous injection of foreign protein or drinking a cocktail, the face always becomes warm before the hands and, similarly, the hands before the feet.

#### Passive Vascular Exercise and the Treatment of Peripheral Vascular Disease

DR JOHN R SMITH, St Louis. The development of the method of passive vascular exercise for the treatment of peripheral vascular disease, particularly for the lesions associated with occlusion of the peripheral arteries, was at first welcomed enthusiastically, but subsequent reports have expressed disappointment in the results obtained by its use. Our observations, begun shortly after the introduction of the device, were equally discouraging. The difficulties led us to devise experiments on the normal and pathologic physiology of arterial and venous blood flow in the lower extremity. The isolated limb was perfused with defibrinated blood, and the effects of position and negative pressure, by using the boot, were noted. The results of these studies emphasized two points as important factors in increasing arterial flow, the necessity of increased venous pressure and the use of hypertonic saline solution to assist in opening the arteries. These observations led us to devise an instrument employing multiple blood pressure cuffs, applied to the diseased extremity, by which the venous pressure could be elevated. Twenty-six patients with different types of occlusive arterial disease had been treated by the method of passive vascular exercise, hypertonic saline and intravenous typhoid vaccine being used as a stimulant to the arterial tree. The results were disappointing in each case. Twenty-three patients were treated by the method of increasing venous pressure, concentrated saline solution and arterial stimulation with most encouraging results. The experimental and clinical study suggests three important factors in the treatment of peripheral vascular disease: maintenance of high venous pressure, the use of hypertonic saline solution and stimulation of the arterial tree.

#### DISCUSSION

DR GEZA DE TAKATS, Chicago. In my observations, intermittent elevation of the venous pressure helped in bringing about relief from symptoms. Has Dr Smith found why it is necessary to use multiple cuffs and why a single cuff inflated to 60 mm of mercury would not bring about the same result in stretching the venocapillary bed? Another question is whether the injection of a large amount of salt solution is



really superior to giving physiologic solution of sodium chloride by mouth. I found that the effect of the hypertonic salt solution wears off in one hour and that drinking of a gallon of Ringer's solution a day seems sufficient. With regard to arterial stimulation, patients who were otherwise suitable for sympathectomy were subjected to this procedure and obtained a far greater stretch of the venocapillary bed after the venous pressure was raised.

DR JOHN R. SMITH, St. Louis. Concerning the changes taking place in these extremities when the patients' pressure was elevated, we thought that the application of multiple cuffs would result in greater pressure and in a more rapid escape of blood into the deeper tissues and into the veins. Another reason why we thought multiple cuffs might be better was that they gave a dilatation of the skin vessels. Concerning hypertonic solution, since the capillary stretching has been described as a reaction of degeneration, and because it has been known by many observers that hypertonic solution is more suitable, the attempt was made here to show that hypertonic solution would be preferable.

#### Sodium Nitrite for Testing the Flexibility of the Peripheral Vascular Bed

DRS WILLIAM C. BECK and GÉZA DE TAKATS, Chicago. For a test of the capacity of the terminal vascular bed, a simple and safe ambulatory test was devised. A preliminary determination of an oscillometric curve is made, followed by the intravenous administration of 0.04 Gm (two-thirds grain) of a freshly dissolved solution of sodium nitrite. From ten to fifteen minutes later, a second oscillometric curve is determined. The comparison of the two curves with regard to the height of oscillations and the shift of the spikes toward lower levels of pressure gives a graphic illustration of peripheral vascular capacity. The dose has been so selected that, while it produces a dilatation in the peripheral vascular bed, systemic blood pressure is maintained. It has been used as a prognostic test to indicate the possible value of sympathectomy and of certain types of vascular exercises in the treatment of peripheral circulatory disturbances.

#### DISCUSSION

DR GÉZA DE TAKATS, Chicago. In none of these cases was there a fall in systolic blood pressure. The dose was so selected that blood pressure did not need to fall.

#### Reduced Cevitamic Acid in Blood and Urine in Adult Scurvy

DRS M. A. SPELLBERG and ROBERT W. KEETON, Chicago. Studies of urinary excretion and blood plasma concentration of reduced cevitic acid were done on normally nourished individuals, on patients with moderate prolonged deficiency of vitamin C and on patients suffering from purpura, hyperthyroidism, malignant growths and scurvy. Following determination of the basal level of urinary excretion and plasma concentration, the subjects were given orally 400 mg of pure cevitic acid daily in the form of tablets. The normal individuals showed a quick rise in urinary excretion usually after the first large dose. The undernourished individuals showed a sharp rise several days later. Saturation, which is regarded by us as the point when the individual excretes every twenty-four hours 75 per cent or more of the 400 mg dose, was reached by the well nourished individuals in several days, and usually within seven days by the undernourished. In contradistinction to this the patients with scurvy did not show a conspicuous rise in urinary excretion till the seventh day, and a saturation point was not reached even after eighteen days of the high vitamin dosage in one patient, and was attained only after one month in the other patient. The lowest blood plasma concentration of cevitic acid was found in a patient with scurvy who had a value of 0.3 mg per hundred cubic centimeters. In the normal and subnourished patients the plasma cevitic acid rose to 1.1 mg per hundred cubic centimeters or higher just as soon as a sharp rise in the urinary excretion occurred. The patient with scurvy, however, showed a value of only 0.59 mg per hundred cubic centimeters with an excretion of over 200 mg and thus after the patient was receiving large doses for two weeks. A value above 1.07 mg was never obtained in our case of scurvy. The tourniquet test continued positive till the plasma concentration was persistently around 1 mg per

hundred cubic centimeters. One of our cases, which was clinically suggestive of scurvy, showed a sharp rise in excretion on the second day and saturation on the fourth day. The plasma concentration rose to 1.26 mg per hundred cubic centimeters after 600 mg of cevitic acid had been given. In other cases of purpura behaved in a similar manner. This proved that the diagnosis of scurvy was not tenable and that alternate one of idiopathic purpura was accepted. The patient with hyperthyroidism and malignant growths showed a rapid rise of the blood plasma concentration to normal, but the urinary excretion never reached 300 mg in twenty-four hours. This was attributed to increased destruction of vitamin incident to the accelerated oxidative processes, in hyperthyroidism and the rapidly growing embryonic tissues of the malignant growths. The procedure used by us in the urinary studies was Birch-Harris and Ray's modification of Tillman's method. The blood plasma values quoted were of fasting specimens determined by the technique of Farmer and Abt with minor modifications. More recently the technique has been modified by the addition of potassium cyanide to fresh blood specimens. This yields somewhat higher values.

#### DISCUSSION

DR S. A. PEOPLES, Louisville, Ky. How often is the kidney threshold for cevitic acid, if there is a threshold lower in scurvy?

DR M. A. SPELLBERG, Chicago. We are unable to say what changes took place in the kidney. There were studies done on patients with renal damage and it was impossible to prove that renal damage had anything to do with vitamin C excretion. That is, a patient with renal damage will excrete vitamin C like a normal individual. There were no signs of renal damage in this particular patient and therefore there was no reason to assume that renal damage can be an explanation for this difference in response.

#### Influence of Liquid Petrolatum on the Blood Carotene Content in Human Beings

DRS ARTHUR C. CURTIS and EDWARD M. KINF, Ann Arbor, Mich. In 1927 Burrows and Farr, and shortly thereafter Dutcher, Ely and Honeywell, showed that rats fed vitamin A in the form of butter fat developed signs of vitamin A deficiency if the butter fat was mixed with liquid petrolatum. Two years later Moness and Christensen found that vitamin A deficiency did not occur when the vitamin A was fed as cod liver oil mixed with liquid petrolatum. It was not apparent why liquid petrolatum should have a different effect on the vitamin A content of butter fat and cod liver oil until Moore showed that carotene and vitamin A were separate substances. The preferential solubility of hydrocarbon carotene in the hydrocarbon liquid petrolatum and the apparent lack of solubility of the sterol vitamin A in liquid petrolatum has been shown by Dutcher, Paris, Hartsler and Guerrant. Our study deals with the repetition of the carotene feeding experiments on man. Throughout the interval of observation, the patients were fed either a weighed high carotene diet alone or a weighed low carotene diet with added carotene. For definite periods, 20 cc of liquid petrolatum was given, three times daily, twice daily before meals, or as 30 cc before retiring. Blood carotene determinations were made at frequent intervals. A definite fall in the blood carotene occurred when liquid petrolatum was given in 20 cc amounts three times or twice daily before meals. Little, if any, effect on the blood carotene was observed when 30 cc was given before retiring.

#### DISCUSSION

DR EDWIN L. GARDNER, Minneapolis. What effect if any is there on absorption or increased motility of the gastrointestinal tract?

DR ARTHUR C. CURTIS, Ann Arbor, Mich. When we are using large doses of liquid petrolatum there was an increase in hypermotility of the gastrointestinal tract. It has been shown by Dutcher and his co-workers on animals that the hydrocarbon carotene has a preferential solubility in the hydrocarbon liquid petrolatum. When the hypermotility of the gastrointestinal tract was slowed by prescribing bismuth subcarbonate with the liquid petrolatum, no increase in the blood carotene occurred.

(To be continued)

## Current Medical Literature

### AMERICAN

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#### American Journal of Public Health, New York

27 1207 1328 (Dec) 1937

A Lawyer's View of Vital Statistics J S Straborn Jr Baltimore—p 1207

What Is a Delayed Certificate and Under What Conditions and Requirements Should It Be Filed? F H Reeder Jr Charleston W Va—p 1216

Medical Care as a Public Health Function Josephine Roche Washington D C—p 1221

Advances in Public Health Nursing Elizabeth Fox New Haven Conn—p 1227

Diet and Resistance to Infection II Effect of Maternal Diet C F Church Claire Foster and Dorothy W Asher Philadelphia—p 1232

Advantages of Peptone Iron Agar for Routine Detection of Hydrogen Sulfide Production R P Tittler and L A Sandholzer Rochester N Y—p 1240

Practical Study of Procedures for Detection of Presence of Coliform Organisms in Water M H McCrady Montreal—p 1243

\*Milk Borne Streptococcal Infections E L Stebbins H S Ingraham and Elizabeth A Reed Albany N Y—p 1259

What the Medical Student Should Be Taught About Vital Statistics T J LeBlanc Cincinnati—p 1273

Organism Resembling Haemophilus Pertussis with Especial Reference to Color Changes Produced by Its Growth on Certain Media W L Bradford and Betty Slavin Rochester N Y—p 1277

Rapid Method for Demonstrating Negri Bodies in Tissue Sections J Schleifstein Albany N Y—p 1283

**Milk-Borne Streptococcal Infections**—Stebbins and his associates give the clinical and epidemiologic observations made by members of the Division of Communicable Diseases of the New York State Department of Health in seven milk-borne epidemics of streptococcal infection comprising 1,529 cases and twenty-four deaths occurring in 1934, 1935 and 1936. In three of the epidemics 806 cases were classified as scarlet fever, and four epidemics consisting of 723 cases were classified as septic sore throat. The epidemics occurred in villages of less than 6,000 population and in each instance the milk supply was incriminated. Elimination or pasteurization of the incriminated milk supply was followed by a marked decline in case incidence. Acute mastitis in members of the producing herds was discovered in six of the seven epidemics. The organism isolated from milk produced by the cows suffering from mastitis in each instance was a hemolytic streptococcus of the type usually associated with human infection (Lancefield's group A) and was indistinguishable from the organism isolated from throat cultures obtained from typical cases observed in the same epidemic. About 25 per cent of the patients seen during each epidemic developed one or more serious complications (arthritis and rheumatism, otitis media, mastoiditis, quinsy, cervical abscess, nephritis, pneumonia, sinusitis and erysipelas). These complications occurred with about the same frequency in outbreaks of scarlet fever and septic sore throat. A previous attack of a streptococcal infection diagnosed scarlet fever apparently produced little or no immunity to subsequent infection with the hemolytic streptococcus associated with epidemics of either milk-borne scarlet fever or septic sore throat. The only difference between these two groups appeared to be the proportion of cases in which a rash was observed. A rash developed in less than 30 per cent of the patients attacked previously, while a rash developed in nearly 65 per cent of those with no history of scarlet fever. The proportion of negative skin tests in the group who had recently recovered from scarlet fever was twice that observed in the group tested in the same community who had not been ill during the epidemic. Among scarlet fever patients equally high percentages of negative tests were observed in those who did not have a rash and in those who had a typical scarlet

fever rash. Among those tested following an epidemic of septic sore throat, there was no difference between the percentage of negative skin tests among persons who had recently suffered an attack of the infection and those who had not. A decreased incidence of rash with increasing age was observed which closely paralleled the decrease in skin sensitivity as measured by the skin test in the general population.

#### Annals of Otol, Rhinol and Laryngology, St Louis

46 865 1152 (Dec) 1937

\*Chronic Progressive Deafness from Nutritional Standpoint Preliminary Report G Selfridge San Francisco—p 875

Significance of Myelin Sheath Degeneration for Cochlear Nerve W P Covell and L Noble San Francisco—p 895

Sheath of Internal Carotid Artery Route for Infections from Primary Lesions I Frank and Celia Scheer Chicago—p 912

Tensor Tympani Muscle and Its Relation to Sound Conduction E G Wever and C W Bray Princeton N J—p 947

Ray Visualization of Nasolacrimal Duct G E Hourn St Louis—p 962

Wever and Bray Phenomenon Summary of Data Concerning Origin of Cochlear Effect C S Hallpike London England and A F Rawdon Smith Cambridge England—p 976

Bilateral Xanthomatosis (Lipoidosis) of Mastoid Case Report V V Wood St Louis—p 991

Progress in Laryngology L A Schall and J R Richardson Boston—p 1009

\*Tonsillectomy for Rheumatism Study of 3,172 Cases W H Turnley Stamford Conn—p 1050

Observations in 300 Cases of Acute Mastoiditis G C Kreutz and G L Witter Detroit—p 1060

Supraglottic Laryngeal Edema Characteristic Respiratory Sounds as an Aid in Diagnosis A H Neffson New York—p 1065

\*Seasonal Variations in Blood Coagulation Study Based on 1,676 Cases L K Rosensold Los Angeles and J B Miller, San Jose Calif—p 1068

Clinicopathologic Observations of Otitis Media and Paratyphoid L M Sellers Dallas Texas—p 1074

**Chronic Progressive Deafness and Nutrition**—During the last year Selfridge studied five cases of chronic progressive deafness from the standpoint of their dietary histories. A probable relationship between nutritional deficiencies and chronic progressive deafness is pointed out. The dietary histories of the patients have been correlated with studies of the chemical constituents of the blood. The patients have been given various vitamin concentrates, including the B complex. The studies indicate that more than one factor may be involved in chronic progressive deafness. A vitamin C deficiency may initiate metabolic disturbances in the bone if there is a lack of optimal calcium and phosphorus intake. In the early cases, with beginning loss, the use of vitamin B<sub>1</sub> in solution containing 500 international units, correcting the dietary errors and including a plentiful amount of vitamin B foods is sufficient to restore most of the hearing. In those cases in which the loss extends to 1,024 cycles, the entire vitamin B complex should be used. In relation to the changes in the nerve observed in chronic progressive deafness when the loss of hearing is 25 per cent and more, it seems advisable to use a preparation containing only the vitamin B complex. A relationship between the various vitamins, ductless glands and electrolytes is not to be overlooked. If the lack of vitamins of the B complex can explain the changes in the nerve and the vasomotor mechanism, it is probable that a lack of vitamin C might explain changes in bone metabolism. Such a hypothesis may be incorrect, since considerable information is needed before interrelationships of the way in which vitamins, ductless glands and electrolytes control body metabolism is thoroughly understood. Nevertheless it is obvious that dietary disturbances play an important part in otologic problems.

**Tonsillectomy for Rheumatism**—Turnley states that in 65,253 tonsillectomies (3,546 with a history of rheumatism) there were six deaths, not one of which was due to hemorrhage directly. Of the rheumatic patients 3,172 were examined at the end of one, two, three, four, five and six years. About 7 per cent of the total patients examined gave a history of some form of rheumatism. About 25 per cent of the rheumatic patients gave a history of some cardiac ailment. About 6 per cent of the rheumatic patients mostly less than 20 years of age, gave a history of acute rheumatic fever. The ages of the rheumatic patients operated on varied from 3 to 69 years. The duration of attacks also varied, intermittently, from a few

months to twenty years. The greatest percentage of rheumatism was in the group from 30 to 40 years of age. As to results, it was difficult to figure for each age the percentage cured, improved, unimproved or worse. The average was about 83 per cent giving a history of either no further trouble or of being definitely better. About 12 per cent said they had noticed no difference and about 5 per cent said they were worse. There were some who were relieved immediately, but the majority showed improvement within the year. Curiously enough, some reported their rheumatism worse, or they had an acute attack immediately following the operation. The younger the patients and the shorter the duration of the rheumatism, the more marked the improvement, and vice versa. Of those who gave a history of no improvement, almost all had some complication or other foci of infection. Also they were past their youth. Of those who became worse, not one said he was worse because of operation. On the contrary, most of them were benefited in one way or another.

**Seasonal Variations in Blood Coagulation**—Rosenqvist and Miller investigated the seasonal variations in blood coagulation from the tonsillectomy records of 1,676 patients. The coagulability of the blood as determined by the slide method is decreased during the winter months in southern California (Los Angeles County). This would seem to favor doing elective surgery of the nose and throat during the summer time. The bleeding time does not vary appreciably with the seasons.

### Archives of Neurology and Psychiatry, Chicago

39 1218 (Jan.) 1938

- \*Insulin Shock Treatment of Schizophrenic Patients. S. Katzenelbogen, H. E. Harms and D. A. Clark. Baltimore—p. 1.
- Vesical Activity in Schizophrenic States Associated with Catalepsy. E. S. Tauber, L. G. Lewis and O. R. Langworthy. Baltimore—p. 14.
- Velocity of Blood Flow in Schizophrenia. J. E. Finesinger, M. E. Cohen and K. J. Thomson. Boston—p. 24.
- Studies in Diseases of Muscle. II. Effect of Varying Amounts of Ingested Creatine on Creatine Tolerance in Progressive Muscular Dystrophy. A. T. Mihorath and H. G. Wolff. New York—p. 37.
- Enostoses of Calvarium. Incidence at Autopsies in State Hospitals. Myrtille M. Cavanaugh. Boston—p. 41.
- \*Nature of 'Silver Cells' Occurring in Multiple Sclerosis and Other Diseases. N. Blackman. Fall River, Mass., and T. J. Putnam. Boston—p. 54.
- \*Clinical Evaluation of Use of Fluids in Treatment of Delirium Tremens. P. Piker, Cincinnati—p. 62.
- Intellectual Deterioration in Psychoses. W. Malamud and Eleanor M. Palmer. Iowa City—p. 68.
- Malignant Tumor Within the Third Ventricle. Three Cases of Unusual Type with Invasion of Ventricular Walls. F. R. Ford and W. Muncie. Baltimore—p. 82.
- Electro Encephalography. III. Normal Differentiation of Occipital and Precentral Regions in Man. H. H. Jasper and H. L. Andrews. Providence, R. I.—p. 96.
- Friedreich's Ataxia. Histopathologic Study. G. B. Hassin. Chicago—p. 116.
- Minerals in Normal and in Pathologic Brain Tissue Studied by Micro Incineration and Spectroscopy. L. Alexander and A. Myerson. Boston—p. 131.
- Case of Epilepsy Associated with Meningioma of Optic Nerve Sheath Compressing the Olfactory Centers, Dural Calcifications and Thalamic Lesions. J. W. Papez and R. W. Rundles, Ithaca, N. Y.—p. 150.

**Insulin Shock Treatment of Schizophrenic Patients**—Katzenelbogen and his associates discuss the course of Sakel's insulin treatment in fifteen schizophrenic patients. Distinct improvement and favorable therapeutic results occurred in most of the patients. Favorable therapeutic results were obtained in four patients with a procedure which differs from Sakel's original procedure in several particulars. 1. The total period of treatment was frequently shorter. 2. The injections of insulin were usually given not six times a week but at intervals of two or three days. 3. The fourth therapeutic phase (polarization phase of Sakel) was not used. In one patient a remission was obtained with treatment of only one month's duration. There was a relapse nearly three months after the end of the treatment. The hypoglycemia following injections of insulin remained moderate throughout the treatment. There were discrepancy and lack of consistent relationship between the dose of insulin and the severity of the reactions in all patients. Marked hypersensitivity to insulin was present in one patient for whom the shock dose of insulin was only 25 units. There were disproportion and lack of consistent relationship between the amount of insulin and the degree of hypoglycemia in all

patients. There was discrepancy and lack of consistent correlation between the intensity of the reactions and the degree of the hypoglycemia in all patients.

**"Silver Cells" in Multiple Sclerosis**—Blackman and Putnam undertook a repetition of Steiner's work to determine more closely the nature of the "silver cells" by the use of other stains on adjacent sections and to extend the series of control. Recent work has suggested the possibility that the lesions of both multiple sclerosis and dementia paralytica may be due to local stasis in the smaller blood vessels, and it appeared of interest to see whether thrombotic and hemorrhagic lesions, which bear a resemblance to these diseases, also contain "silver cells." In both cases of multiple sclerosis "silver cells" were easily seen, and in one they were so plentiful as to constitute the majority of infiltrating elements in the adventitial spaces. These cells are observed principally in the adventitia of blood vessels situated toward the periphery of the plaque. In the center of the plaque, where the lesions are older, the "silver cells" are much rarer and in certain lesions are absent. Only in recent, fresh plaques or in older ones which are apparently enlarging are the "silver cells" seen in their most typical aspect. Homologous areas in adjacent areas stained by other techniques showed that the corresponding cells had round or slightly oval nuclei, from about 6 to 8 microns in diameter, with a moderate amount of dispersed chromatin. The cell body was lightly stained with cresyl violet and varied from a small rim to about twice the diameter of the nucleus. It contained particles many of which were yellow or light brown. Sections stained for fat and others stained for myelin showed neither of these substances in the cells. The micro-incinerated sections demonstrated gleaming yellow and white particles, which, according to Alexander, were strongly suggestive of iron and calcium salts. The general character of the cells appears to indicate that they are phagocytes of glial rather than of hematogenous origin. In all control cases, in which neither syphilis nor multiple sclerosis was demonstrated, the red cells and phagocytes containing blood pigment were deeply stained. In three of them typical "silver cells" were seen, which indicates that "silver cells" are characteristic of multiple sclerosis but are not confined to multiple sclerosis and syphilis.

**Fluids in Treatment of Delirium Tremens**—Piker arranged 300 consecutive cases of delirium tremens so as to form two chronologically parallel series. The items of the treatment given in the two series were the same, except the quantities of fluids administered. In one group the fluid intake per patient was limited to 1,000 cc or less per twenty-four hours, in the other, fluids were forced to between 3,000 and 4,000 cc per patient in twenty-four hours. If patients in the group in which fluids were forced did not cooperate, fluids were given by hypodermoclysis. The one detail of the treatment in both series which was permitted to vary according to the course of the illness was the number of drainages of spinal fluid performed in each case. There were eight deaths in each series. Of the patients with a forced intake of fluids who died five presented complications that were of sufficient severity to have been possible causes of death without the coincident delirium tremens. Four of the eight patients receiving limited fluids who died showed complications of similar seriousness. The average stay in the hospital of the 142 patients who had been under a regimen of forced fluids and had recovered was 475 days, and that of the patients who had limited fluids was 465 days. There was a greater incidence of cases in which the course was stormy with the regimen of forced fluids than with that of limited fluids. If the hydration capacity of the brain in delirium tremens is increased above the normal, one might justifiably assume that forcing fluids in delirium tremens increases the available free fluid in the central nervous system and consequently causes an increase in cerebral edema in this condition. Fluids, however, are of value in delirium tremens on two accounts. They increase the circulatory efficiency, stimulate renal function and combat toxicity generally, and the patient is likely to be more comfortable and less restless if it is permitted to have fluids according to his desires. In the exceptional cases in which the patient takes extremely little fluid and has a coincident inordinate rise in temperature fluids should be given by hypodermoclysis, as in toxic conditions other than delirium tremens.

## Archives of Surgery, Chicago

36 1 170 (Jan) 1938

- Behavior of Systemic Blood Pressure Pulse Rate and Spinal Fluid Pressure Associated with Acute Changes in Intracranial Pressure Artificially Produced J Browder and R Meyers Brooklyn—p 1
- \*Abdominal Adhesions and Use of Papain Discussion and Experimental Study J K Donaldson Little Rock Ark—p 20
- \*Disease of Mesenteric Lymph Nodes Its Relation to Appendicitis Gastro-Intestinal Infections and Generalized Diseases Report of 123 Cases Possible Etiology and Treatment A K Foster Jr New York—p 28
- Production of Osteosarcoma in Mouse by Intramedullary Injection of 12 Benzpyrene A Brunswick and A D Bissell Chicago—p 53
- Nicola Operation for Recurrent Dislocation of the Shoulder H Koster Brooklyn—p 61
- Ingested Foreign Body in Gastro Intestinal Tract F F Henderson and E A Gaston, Boston—p 66
- Histologic Structure of Normal Thyroid Gland Variations and Their Significance in Interpretation of Pathologic Conditions of Thyroid Gland C O Rice Minneapolis—p 96
- Subphrenic Abscess Review of 111 Cases and Resume of Subject L A Hochberg Brooklyn—p 111
- \*Treatment of Tumor of Parotid Gland Survey of Results Obtained at the Barnard Free Skin and Cancer Hospital T M Martin St Louis—p 136
- Meckel's Diverticulum Its Incidence and Significance in Routine Operations on Abdomen B A Goodman New York—p 144
- Of Fascia Lata for Reconstruction of Round Ligaments in Correcting Prolapse of Vagina G E Ward Baltimore—p 163

**Abdominal Adhesions and Use of Papain**—Review of the literature on the use of a solution of papain to prevent adhesions reveals that most investigators have felt that it is of value. It appears to Donaldson that Grieco and he alone obtained completely unsatisfactory results with the drug. Nearly all who have worked with papain in connection with adhesions have produced the adhesions by the method developed by Ochsner and his co workers. This consists of rubbing the intestine in the ileocecal region with gauze until it is considered sufficiently irritated or abraded and then applying tincture of iodine to the irritated area. The method the author used to produce adhesions consisted of attaching by a single silk stitch sterile gauze pledgets to the large intestine on each side of the entrance site of the small intestine. Gauze sponges left here for five days or more and then removed left a consistent and fairly constant degree of abrasion, which invariably formed permanent adhesions to adjacent parts after the pledgets were removed. By this method one may instill the solution of papain at the time the sponges are removed and obtain some idea as to its prophylactic value, or else one may allow permanent adhesions to form, separate them, instill the solution and study its efficacy in preventing their reformation. In a series of twenty-six animals he was unable to demonstrate that papain was effective in preventing the reformation of adhesions. Further proof of the consistent stability and solubility of papain would seem desirable before it can be accepted.

**Disease of Mesenteric Lymph Nodes**—Foster considers the importance of the function of the mesenteric lymph nodes in absorbing infection from the intestinal tract. Of the 123 cases of disease of the mesenteric lymph nodes encountered during twenty-two years, an increasing number is noted in which a diagnosis of mesenteric lymphadenitis was made, especially during the last few years. The diagnoses in the 115 cases particularly studied were made by sixteen surgeons on the same staff. It is not possible to conclude definitely that mesenteric lymphadenitis is an entity completely separate from appendicitis or many other intra-abdominal conditions. Mesenteric lymphadenitis either has been occurring more commonly or members of the surgical staff have been more on the lookout for it during the last few years. In about 90 per cent of the cases in the series, appendectomy was performed. The incidence of foci of infection in the upper respiratory tract is sufficiently well recorded to warn examiners when thinking of a diagnosis of mesenteric lymphadenitis to be especially on the lookout for evidence of it. A clinical diagnosis of tuberculous mesenteric lymphadenitis was made in 32 per cent of the 123 cases. Associated conditions included visceropotosis, constipation and disease of the gallbladder, and in eight cases intra-abdominal malignant tumor. The history of recurrent symptoms was so common that it probably deserves a place among the

marked points favoring a diagnosis of mesenteric lymphadenitis. Among the cases of mesenteric lymphadenitis in which there was little beyond involvement of the appendix, there were several in which the appendix contained fecal material and at times *Oxyuris vermicularis*. It is probably not safe to remove a mesenteric lymph node. Appendectomy or any other procedure necessary to remove abnormalities which may have had something to do with the occurrence of mesenteric lymphadenitis is the prescribed treatment. Intestinal stasis and the conditions contributing to it allow chronic absorption of histamine-like substances which can cause mesenteric lymphadenitis, especially when the appendix is abnormal.

**Treatment of Tumor of Parotid Gland**—Of the 65,351 patients admitted to the Barnard Free Skin and Cancer Hospital during twenty-four years, Martin points out that seventy had growths diagnosed as tumor of the parotid gland, thirty-four being mixed tumors and thirty-six malignant. Eighteen of those with mixed tumors received treatment and the diagnosis was confirmed by examination of tissue, while sixteen did not receive treatment and the diagnosis was made merely by clinical examination. In the latter class, treatment was usually refused by the patient because of possible injury to the seventh nerve. The proportion of women to men was 25/9. Twenty-three of the mixed tumors occurred on the right side, while eleven were on the left. The ages of the patients varied between 15 and 74 years, with an average of 47.31 years. Duration of the tumors varied from two months to forty-two years, with an average duration of 11.02 years, showing evidence of a fairly slow rate of growth. The possibility of injury to the seventh nerve usually accounts for the patient's refusal of treatment. Eighteen patients with mixed tumors were treated, fourteen were subjected to simple excision of the mass. Four of the patients were not followed, while ten showed no evidence of recurrence in periods varying from six weeks to nine years. One patient was subjected to a "radical excision" and died two weeks later. One patient was subjected to excision by cautery plus the application of radon (twenty seeds), and in spite of the fact that the section showed mixed tumor she died six months later from cancer. Another patient was treated with radon seeds alone, and recurrence of the tumor was noted twenty-six days after treatment. One patient was treated with excision plus 200 mg. hours of radium element and at the last observation, six weeks after treatment, no recurrence was noted. Of the thirty-six patients with malignant tumors seventeen were treated surgically, six were treated with radiation and thirteen received no treatment. In the group treated surgically, microscopic sections showed fourteen malignant mixed tumors and three squamous cell carcinomas. Biopsy was done in only two of the six cases in which irradiation was employed and the diagnosis in the remaining four was correct because the patients had recurrences or died of the tumor. The ages of the patients in this group varied from 31 to 84 years, with an average of 58.33 years, while the duration of the tumor varied from one month to twenty-five years, with an average of 2.72 years. There were twenty-two men and thirteen women in the group and in one case the sex was not stated. Fifteen tumors were located on the right side and nineteen on the left. The type of surgical treatment that was used varied. Of the seventeen malignant tumors treated surgically there has not been recurrence in six patients in periods varying from seven weeks to fifty-seven months. Irradiation, except for palliation, has not been effective at the hospital.

## Connecticut State Medical Society Journal, Hartford

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- Anxiety Conditions E Kahn E F Gildea P W Preu New Haven
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- Chemical Investigations on Active Principles of Phenomenon of Local Skin Reactivity to Bacterial Filtrates II Physicochemical Properties G Schwartzman and S A Morell, New York—p 1  
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 Studies on Relationship of Sex Hormones to Infection I Effect of Estrogenic and Gonadotropic Hormones on Vaccinia and Spreading Factor D H Sprunt Sara McDearman and J Raper Durham, N C—p 159

**Effect of Hypertrophic Cartilage on Marrow Growth**

—In studying the growth of bone marrow in the cartilage bones of rabbits, Huggins and Smith found that colloidal thorium dioxide injected intravenously remained fixed in the reticulo-endothelial cells without causing any noticeable effect on the animal. The tenacity with which it is held locally and the ease of its identification enabled recognition of new areas of marrow growth, so that the growth pattern stood out plainly. They correlate the observations made on normal marrow growth with previous observations made by them and by others and deduce a hypothesis of marrow growth. Any vessel entering a region of hypertrophic cartilage acquires a phagocytic lining. These phagocytic cells accumulate at the regions at which cartilage is disappearing, to be replaced by bone, and their usual phagocytic character implies the likelihood that they participate in the removal of cartilage. These cells then, or their descendants, are thus placed in the region at which marrow is forming to which they contribute. In addition to the function of cartilage removal, these cells are in a position to form marrow. The epiphyseal plates in this manner polarize length growth of bone marrow. The growth of liver and spleen, on the other hand, was found to be interstitial. Growth in width of the marrow has been shown to be essentially a peripheral effect occurring in the region where bone is being removed to enlarge the marrow cavity. It is possible that peripheral growth is due to some such effect occurring when the marrow cavity is enlarged.

**Hemoglobin Production in Anemia Influenced by Bile Fistula**—According to Hawkins and his co-workers, the presence of a renal bile fistula with escape of all bile into the urinary tract impairs the capacity of an anemic dog to form new hemoglobin on standard diets. These bile fistula dogs will produce about half as much hemoglobin in anemia on standard diets as during earlier control periods without a bile fistula. Iron given by mouth to an anemic bile fistula dog will effect the production of about half the amount of new

hemoglobin as in control periods. Iron given by vein to such a dog will approximate the theoretical 100 per cent return in the utilization of iron by these dogs. The reaction to iron feeding is much like the reaction to iron feeding. The urine body weight and normal clinical state over periods of weeks speak for adequate absorption of protein digestion product. Inadequate hemoglobin production (protein formation) noted in these bile fistula dogs may be related to a disturbed function of the liver.

**Journal of Immunology, Baltimore**

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 Age and Antibody Production III Quantitative Studies on Precipitation Reaction with Antiserums Produced in Young and Adult Rabbits Leona Baumgartner, New York—p 477

**Journal of Urology, Baltimore**

38 509 710 (Dec) 1937

- Large Benign Renal Neoplasms Their Pathology and Clinical Behavior with Report of Five Cases O T Bailey and J H Harrison, Boston—p 509  
 \*Diagnosis and Treatment of Metastatic Renal Infection H G Hamer Indianapolis—p 530  
 Crossed Renal Ectopia (Unilateral Fused or Elongated Kidney) Report of Fourteen Cases Clinically Diagnosed and Two Cases Encountered at Autopsy During Past Eighteen Years E Beer and W L F Ferber New York—p 541  
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 Value of Serial Pyelograms in Hydronephrosis and Nephrophtosis. R E Henline and J L Bray, New York—p 620  
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 \*New Plastic Operation for Stricture at Ureteropelvic Junction Report of Twenty Operations F E B Foley St. Paul—p 643  
 Factors Influencing Operative Procedure in Hydronephrosis W C Quinby Boston—p 673  
 \*Conservative Surgery in Hydronephrosis J C Sargent Milwaukee—p 680  
 Operative Results in Noncalculus Hydronephrosis Results in Series of One Plastic Operations W Walters, H Cabot and J T Prudden Rochester, Minn—p 688

**Metastatic Renal Infection**—While metastatic infection of the kidney is better understood now than formerly, it is impossible to distinguish clinically between infection of the perirenal space and infection of the kidney, the former often being the only manifestation of the latter. In perinephric abscess the majority of cases are secondary to pathologic conditions in the kidney. It is the belief of Hamer that the so-called primary perinephric abscess, or that of metastatic origin, is identical with acute staphylococcal renal infection. In support of this opinion several cases are presented. There are many helpful aids to diagnosis. Cabot has called attention to the importance of prolonged sedimentation of the urine and smears in these cases of staphylococcal infection of the kidney. The leukocyte count is likely to be high, especially in the acute cases. Blood sinking time is said to be of some prognostic value. The use of all diagnostic procedures may fail at times and then a diagnosis of cortical infection of the kidney can be made only after the exclusion of other possible diseases. If the patient is in a septic state and has pain in the renal area and costovertebral tenderness, accompanied by fever, the operation may justify an exploratory operation. Cortical infections sometimes heal spontaneously by absorption or by breakdown through into the perinephric space to form perinephric abscesses. The occasional occurrence of bilateral involvement influences treatment. Unless the aspect of the disease is threatening, a brief period of observation is justified. When infection is severe and the toxemia becomes profound, immediate nephrectomy may be required to save life. If, however, an early diagnosis of cortical abscess is made, good results

will often follow conservative operative treatment. This may be simple incision of the abscess and decapsulation, or excision of the focus of infection followed by open drainage. Suppurative perinephritis also may heal spontaneously, but this is not to be expected. Drainage should be effected as soon as a diagnosis is made. Secondary nephrectomy may be required at a later period.

**Operation for Stricture at Ureteropelvic Junction**—Since the results of former plastic operations for stricture of the ureteropelvic junction causing hydronephrosis have not been all that is to be desired, Foley proposes a new operation. Twenty operations have been performed in nineteen cases. The anatomic, functional and symptomatic results determined by pyelo-ureterograms, tests of function and follow-up information at long intervals after operation are submitted. The new operation appears to yield better results than those reported for other operations of similar purpose and is performed as follows. A large incision with adequate exposure and complete freeing of the kidney is essential. Particular attention is paid to the vascular arrangement and discovery of anomalous vessels playing a part in the obstruction. If such vessels are found, they are held out of obstructing contact with the ureter while pressure on the pelvis determines its freedom of evacuation and the presence or absence of intrinsic obstruction. Adhesions between the pelvis and the ureter are completely severed, thus accurately exposing the ureteropelvic junction, and the latter is examined carefully. The kidney and ureter are held in position to give facility in accurately placing the Y incision in the pelvis and ureter. The stem of the Y is placed in the lateral wall of the ureter and thus will face the pelvis when the normal position is restored. The incision is carried through the ureteropelvic junction and downward in the medial wall of the pelvis an appropriate distance below the ureteropelvic junction. From this point the incision continues as two diverging limbs in the lower medial wall of the pelvis in the form of an inverted V. The incision in the ureter should equal in length the incision in the pelvis and the length of the V shaped flap. The triangular opening in the pelvis and the triangular flap of pelvic wall when turned down face the incision in the ureter directly. The apex of the flap approximates directly the lower angle of the ureteral incision. By closely spaced interrupted sutures of 0000 chromic gut embracing only the muscularis, with careful avoidance of the mucosa, the edges of the ureteral incision are approximated directly to the edges of the triangular defect in the pelvis, and the tip of the flap fits neatly into the lower end of the ureteral incision. On completion of the suture a soft rubber catheter of size F 10 or F 12 is introduced through a small stab wound opening on the posterior surface of the pelvis and is directed into the ureter a distance of 6 or 8 cm. A number of small fenestrations are cut in the portion of the catheter lying within the pelvis. The catheter serves to splint the sutured segment and provides for drainage of urine from the pelvis. It is left in place for about one week. A second catheter extending only into the pelvis is introduced for use in through and through irrigation. On removal of the splinting catheter the second catheter may be used to test the freedom with which a colored solution will pass into the bladder.

**Conservative Surgery in Hydronephrosis**—Sargent presents brief reports of twelve cases in which operation was performed. Of ten patients, two presented fully developed bilateral hydronephrosis. In six patients hydronephrosis was well developed on but one side, though the other kidney was potentially hydronephrotic. In only two of ten patients was the opposite kidney found to be truly normal. Of the twelve operations the result in six was excellent. All symptoms have been relieved, infection has completely disappeared, pelvic drainage continues perfectly free, and renal function has been found definitely improved. In three of these six cases the Mikulicz type of plastic operation was used, while in the other three the pelvis was completely reconstructed after resection of most of the extrarenal part of the hydronephrotic sac. In five of the remaining six operations long term studies prove a definitely good result. All symptoms have been relieved, infection has been materially reduced and pelvic drainage has been greatly improved, pelvic residual urine is considerably less

than pelvic capacity, and renal function has improved definitely. Two of these five operations were done by lateral ureteropelvic anastomosis, one by complete ureteropelvic neostomy and one each by using the Mikulicz and the Foley Y plastic procedure. A distinctly poor result was evident in the remaining case. While the patient has not yet come to secondary nephrectomy, studies point clearly to the fact that the obstruction remains and that the hydronephrosis continues to progress. The choice of procedure (Y plastic) does not explain the failure, rather the author is inclined to hold responsible the fact that the hydronephrosis was quite small, making a good mechanical correction of the deformity the more difficult. Nephrectomy in hydronephrosis should be reserved for cases in which the kidney is known to be utterly worthless and for cases in which plastic correction has been employed and has failed.

### Laryngoscope, St. Louis

47 847 914 (Dec) 1937

- Factual Background for Treatment of Progressive Deafness from Otosclerosis E. P. Fowler New York—p. 847  
\*New Technic in Surgical Treatment of Severe and Progressive Deafness from Otosclerosis M. Sourdis Nantes France—p. 853  
Eye Deviation and Nystagmus in Guinea Pigs with Lesions of Cerebellum and Brain Stem A. R. Buchanan Chicago—p. 874  
Nasofrontal Tract in External Frontoethmoidectomy F. L. Bryant Minneapolis—p. 901  
Carcinoma of Pharynx D. C. Baker Jr. Philadelphia—p. 904

**Surgical Treatment of Deafness from Otosclerosis**—Sourdis believes that the direct mobilization of the perilymph of a filled labyrinth is possible. It is sufficient to place on the labyrinthine fistula, either directly or else with interposition of thin cushions of fat or connective tissue, a prosthesis of a certain weight a foreign body such as a piece of gutta percha (Barany, Holmgren). These masses in contact with the bony walls of the mastoid receive sound vibrations by bone conduction and are displaced by them. This movement induced at the level of the labyrinthine fistula produces little shocks which hit the perilymph and set it in motion. This is what the author has called the mechanism of the bell. The indirect mobilization of the perilymph in a filled labyrinth can be produced by mobilization of the membrane covering the labyrinthine fistula by means of a reconstructed tympanic system. He has named the method "tympanolabyrinthopexy" and it consists in joining the covering membranes of the labyrinthine fistula with the superior border of the tympanic membrane, the excursions of which have been increased by the resection of the head of the malleus. The incus preserved in its high position serves as a mobile prop and permits the displacement of the entire system. Tympanolabyrinthopexy is performed in three principal stages separated by intervals of about four or five months. The first two stages are devoted to the transformation of the tympanic system and the thorough modifications of the mastoid region. The third stage consists in the establishment of the labyrinthine fistula at the level of the new tympanic system. The operation has been performed on 109 patients with ten times and more previous hearing distance in 40 per cent, from five to ten times previous hearing distance in 14 per cent and mediocre results, from two to five times previous hearing distance, in 20 per cent. There were no fatalities.

### Military Surgeon, Washington, D. C.

52 1 80 (Jan) 1938

- Diabetes and Protamine Insulin E. P. Joslin—p. 1  
Charles Bell and the Origin of His Engravings of the Arteries H. W. Jones—p. 10  
\*Deprivation of Sunlight as Possible Factor in War Dropsy Prison Edema W. L. Mann—p. 30  
Polymyelitis in Manitoba (1936) F. W. Jackson—p. 42  
\*New Method of Treating Scabies R. A. Nolan—p. 52

**War Dropsy and Prison Edema**—To locate the etiologic factors in a highly fatal disease in the prisons of Haiti, Mann found that the causal factor was that the prisoners were cut off from the direct rays of sunlight. Prison edema, as observed in Haiti and described in Europe is a clinical entity. Brachycardia, hypothermia and the absence of motor paralyses differentiate prison edema from beriberi. Nutritional edema is a generic term which includes a class of diseases such as prison edema, epidemic dropsy and beriberi. The controlling etiologic factor in causing practically every case of prison edema



observed in Haiti was attributed to the deprivation of the sun's rays. Direct sunlight has an edema-preventive action on persons subsisting on a faulty diet. The Negro races on a marginal dietary require a greater intensity of exposure to sunlight. Prisoners at work and with free access to direct sunlight were able to maintain apparently excellent health when fed a so-called "deficient diet." Yet prisoners confined at rest and deprived of direct sunlight contracted the highly fatal edematous disease. The combination of faulty diet and deprivation of the sun's rays caused manifestation of prison edema to appear early—occasionally within ten to fifteen days. The important nutritive substance the lack of which is responsible for prison edema is yet unidentified. Experiences in Haiti demonstrate the importance of considering direct exposure to sunlight in planning camps for prisoners of war.

**New Method of Treating Scabies**—Nolan uses a bland paste soap as a vehicle for sublimed sulfur, which combined is applied as a copious lather and allowed to dry, leaving a sulfured film on the body. For treatment this procedure is repeated for three days, with daily changes of underwear. The sulfur soap paste contains 18 per cent of sulfur, as compared with the official ointment containing 15 per cent, and requires only about 4 Gm for one satisfactory application. Experience has demonstrated that less than 1 Gm of sulfur, evenly distributed in a thin soap film over the surface of the body, will produce sufficient hydrogen sulfide to discourage the itch mite from lodging in seams and underclothing. One application suffices for prophylaxis. The continuous production of hydrogen sulfide gas is lethal to the mite. This idea would be of further value in epidemic typhus, rocky mountain spotted fever, plague and similar conditions in which insect repellency is a distinct prophylactic factor.

### Missouri State Medical Assn. Journal, St. Louis

35 136 (Jan) 1938

- Chronic Prostate. Points of Interest to Average Practitioner N S Moore and S M Tapper St. Louis—p 1  
Diagnosis and Treatment of Diseases of the Esophagus J S Knight, Kansas City—p 4  
Care of the Non-Hospital Indigent J E Cook St. Louis—p 7  
Importance of Early Recognition of Neurosurgical Conditions L T Furlow St. Louis—p 9  
Errors of Refraction in Children C Beisbarth St. Louis—p 15  
Fatal Noma in Infancy A Van Ravenswaay Boonville—p 17

### Nebraska State Medical Journal, Lincoln

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- Importance of Daily Variability of Diabetes F L Rogers Lincoln—p 1  
Tendon and Nerve Injuries in Fractures and Dislocations H F Johnson Omaha—p 4  
Thoracic Wall Injuries Complicated by Lesions to Thoracic and Abdominal Viscera Emergency Treatment W R Cubbins J J Callahan and C S Scuderi Chicago—p 11  
Studies on Omaha Milk. II Bacterial Population of Market Milk J D Le Mar and M F Gunderson Omaha—p 13  
Convalescent Serum Center and Its Value to the Community C M Hyland Los Angeles—p 17  
\*Studies in Peritoneal Immunity H B Morton Lincoln—p 22  
Common Intranasal and Sinus Pathology E E Koebbe Columbus—p 24

**Studies in Peritoneal Immunity**—Morton describes the response of the omental tissue of man to intraperitoneal infection or irritation. He studied stained sections of omentums from patients who have had preoperative intraperitoneal injections and from patients in whom acute and subacute intra-abdominal inflammatory reaction was found at operation. These omentums on gross inspection vary in color from a slight pinkish tint to light red and are commonly found in an acute or subacute abdominal condition. On microscopic section they show dilatation and engorgement of the capillaries, commensurate with the amount of inflammatory reaction as evidenced by color. Around the capillaries and in the connective tissue meshwork are varying numbers and proportions of polymorphonuclear leukocytes and mononuclear cells. These vary with the severity and duration of the intraperitoneal irritation. In the cases in which the infection or irritation has been of short duration the predominant cell is found to be the polymorphonuclear neutrophil. When the process is of longer duration there is a shift in favor of the monocytes. All writers on the subject of

peritoneal immunity seem to agree that defense is dependent on a local leukocytosis, but opinion seems divided as to the relative importance of the polymorphonuclear cell and the mononuclear cell in the defense mechanism. A fairly constant finding in favor of the monocyte as the more important cell in peritoneal defense is the corresponding interval of time required for establishment of immunity and mobilization of the macrophage cells. The latter type of cell has been shown to possess greater phagocytic power. It has also been shown experimentally that the presence of enormous numbers of polymorphonuclear leukocytes alone will not successfully combat extensive intraperitoneal infection. Intraperitoneal immunity is always a variable quantity and its adequacy in protecting the organism against the invasion of pathogenic organisms will be determined in any given case by balancing the strength of the local defense mechanism against the magnitude of the invading infection.

### New England Journal of Medicine, Boston

217 1017 1062 (Dec 23) 1937

- Spasticity and Frontal Lobes Review J F Fulton New Haven Conn.—p 1017  
\*Para Aminobenzenesulfonamide and Its Derivatives in Treatment of Beta Hemolytic Streptococcus Infections of Middle Ear and Mastoid Report of Six Cases in Children C G Flake and B W Carey Jr Boston—p 1033  
Surgical Training in the Non-University Hospital Presidential Address L C Kingman Providence R I—p 1039  
Iodine Response and Other Factors in Their Relation to Mortality in Thyrotoxicosis J Lerman Boston—p 1041

**Sulfanilamide in Streptococcal Infections**—Flake and Carey used sulfanilamide and its derivatives in the treatment of complications of the middle ear and mastoid caused by beta hemolytic streptococci. There were three patients with meningitis, one with sterile meningitis, one with perisinus abscess and septicemia and one with postscarlatinal mastoiditis. The plan of dosage of sulfanilamide and its derivatives used at the Infants' and the Children's hospitals is as follows. By mouth an initial dose of approximately 0.6 Gm sulfanilamide tablets to each 20 pounds (9 Kg) of body weight, followed by a maintenance dose of 0.06 Gm per pound of body weight for each twenty-four hours divided into four or six doses. Intramuscularly a 2.5 per cent aqueous prontosil solution, 1 cc per pound of body weight in twenty-four hours, divided into four or six doses. Subcutaneously sulfanilamide (0.8 per cent in physiologic solution of sodium chloride) was given in an initial injection of 100 cc to each 20 pounds of body weight, followed by maintenance injections of 100 cc to each 40 pounds (18 Kg) of body weight every eight to twelve hours. Intrathecaly sulfanilamide (0.8 per cent in physiologic solution of sodium chloride) was given in amounts from 5 to 10 cc, less than the volume of cerebrospinal fluid withdrawn by lumbar puncture, injected once or twice daily according to the circumstances. Sulfanilamide tablets were given whenever oral administration was not contraindicated by nausea or vomiting. In such an event prontosil solution or sulfanilamide was administered parenterally. The concentration of sulfanilamide in the blood of patients receiving the drugs under this schedule of dosage was found to be from 10 to 15 mg per cent (Marshall's method). A rigid rule of dosage could not be adhered to in every case, as each patient presented an individual problem. In general, however, an attempt was made to follow the foregoing method. All patients recovered, and there was no evidence of sequels.

217 1063 1116 (Dec 30) 1937

- Some Medical Aspects of Renal Stone Problem F Albright Boston—p 1063  
\*Insidiousness of Certain Cancers of Genito-Urinary Organs E R Mintz Boston—p 1066  
Treatment of Pyogenic Cystitis C L Deming, New Haven Conn.—p 1069  
Transurethral Prostatic Resection versus Prostatectomy J D Barrett Boston—p 1073  
The Present Day Treatment of Puerperal Eclampsia H M Telford Brookline Mass—p 1078  
Sensitivity to Drene Shampoo J B Biederman Cincinnati—p 1082

**Cancer of Genito-Urinary Organs**—Because symptoms due to metastatic disease, and not the primary source, lead the patient to consult the physician, Mintz reviews 105 cases of renal, 200 of prostatic and 100 cases of testicular cancer. The chief complaint in twenty-three cases of cancer of the kidney



was not related to the urinary tract. In seven it was in the gastro-intestinal canal and was manifested by such symptoms as epigastric pain, colic, indigestion, jaundice, nausea, subacute intestinal obstruction and constipation. Marked general symptoms gave the first sign of malignancy in four cases, the patients complaining of weakness, loss of weight, anorexia and asthenia. In six cases symptoms referable to the osseous system gave the patient the first clue that something was wrong. Symptoms referable to the respiratory tract occurred in one case of this series. The initial symptoms in many cases were due to complete or partial obstruction of some vessel or duct or to pressure or invasion of the gastro-intestinal tract. A supraclavicular sentinel node was the first indication in one case that a malignant condition was present. It is significant that in twenty-three cases, or about 22 per cent, the warning symptoms were distinctly not related to the urinary tract. Yet one reads that the classic symptoms are tumor, hematuria and pain. There were also twenty-seven cases in which the urine was absolutely normal at the time of entry. In twenty-four of the 200 cases of prostatic cancer the patients entered with complaints in no way referable to the genito-urinary tract. Twenty-one of these patients gave no history of any trouble with micturition in the form of dysuria, frequency or nocturia, in practically all the cases the lesion was well advanced before such a diagnosis was made or suspected. Some of the symptoms were hydrocele, inability to walk, gastric upsets, loss of weight, anemia, asthenia, constipation and pain in the abdomen. Pain was present in seventy-one cases of prostatic cancer. The location of the pain was in the back, back and legs or hip, abdomen or shoulder, legs, legs and hip or rectum, or hip, thigh, knee, penis, abdomen, rectum or shoulder. In the group of 100 testicular cancers it was found that thirty-seven patients complained of symptoms that were not referable to the scrotum. A number of patients entered the hospital for relief of some gastric symptom or for low back pain. Few if any had symptoms referable to the respiratory tract. Supraclavicular and cervical nodular enlargements may be the first sign of trouble. Enlargement of the breast is a not uncommon symptom. Testicular tumors do not give rise to local pain, and a fair number of the small ones do not produce demonstrable swelling, therefore it is not difficult to see why patients go for a long time without knowing that they have cancer and find out about it only when symptoms are caused by metastatic disease.

### New Jersey Medical Society Journal, Trenton

34 711 770 (Dec.) 1937

Anemia A Yaguda Newark—p 717  
Suprarenal Gland in Treatment of Glaucoma Progressive Myopia and Some Allergic Conditions S L Haseltine Elizabeth—p 729  
Recent Advances in Vernal Conjunctivitis L Lehrfeld Philadelphia—p 731

### New York State Journal of Medicine, New York

38 182 (Jan 1) 1938

Poliomyelitis Present Status of Our Knowledge J F Landon New York—p 1  
Neglected Health Factors in Public Schools W Roenson New York—p 7  
Surgical Treatment of Strabismus J H Dunnington New York—p 12  
Rupture of Urinary Bladder Secondary to Urethral Stricture M R Keen Huntington and A I Goldschlager Islip—p 19  
\*Role of Food Allergy in Diseases of Skin J G Hopkins New York—p 23  
Echinococcosis of Pelvis Report of Case Involving Right Broad Ligament A J Raggi New York—p 29  
Nephritic Hypertension Treatment with Diuretic Agent Obtained from Animal Kidney B Jablons New York—p 31  
Relationship of Thyroid Disease to Otolaryngology H G Bullwinkel New York—p 47  
Villous Tumor of Rectum W F Preusser Albany—p 51

**Role of Food Allergy in Diseases of Skin**—Hopkins points out that the type of antigen does not determine the type of clinical response, for example, asthma may in one individual be due to a food or epidermal protein, in another individual to a bacterial protein and in a third to a nonprotein substance such as acetylsalicylic acid. The same is true of urticaria and of the inflammatory lesions of the skin. Egg may cause asthma in one individual, urticaria in another and eczema in a third. The variation in symptoms which different individuals present

after reaction to the same antigen is generally explained on the hypothesis that different tissues are sensitized. Some of the dermatoses attributed to food allergy are urticaria, angioneurotic edema, eczema, weeping dermatitis of the extremities, aphthae, herpes, acneiform eruptions, pruritus ani or vulvae, purpura and erythema multiforme and contact dermatitis from foods. As in most allergic diseases, the history is probably the most important aid in the diagnosis of food allergy. In the allergic eczemas the clinical appearance is also of great help. Cutaneous tests are sometimes of real value but they have fallen into disrepute probably because so many have expected that by merely making skin tests one can make an etiologic diagnosis. In acute urticarias of adults, which are perhaps the most clear-cut examples of cutaneous eruptions due to food allergy, it is rather unusual to find positive cutaneous tests. Elimination diets are the most conclusive means of detecting food allergy. It is useless to attempt them unless the patient regards his disease as a major problem and is willing to submit to considerable inconvenience and privation. If patients are found sensitive to unimportant foods, it is quite satisfactory simply to exclude these foods from their diet. When, however, they are found allergic to egg, milk or wheat, permanent exclusion of the food from the diet is utterly impractical. The oral method of desensitization is useful in such cases. It is simply an imitation of the method by which the majority of infants become spontaneously desensitized.

### Southern Medical Journal, Birmingham, Ala

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Nature of Certain Kidney Tumors E R Whitmore Washington D C—p 1149  
Prostatic Surgery H H Young Baltimore—p 1157  
Treatment of Gonococcal Infections with Sulfamidamide J A C Colston J E Dees and H C Harrill, Baltimore—p 1165  
\*Prontosil in Treatment of Malaria Report of 100 Cases R A Hill and M H Goodwin Jr, Thomasville, Ga—p 1170  
Individual Chemoprophylaxis of Malaria Report of Second Year's Investigation M E Winchester Brunswick Ga—p 1172  
Differential Diagnosis of Painless Jaundice W R Johnson Asheville N C—p 1174  
Relative Importance of Food Idiosyncrasy in Gastrointestinal Diseases W C Chaney, Memphis, Tenn—p 1185  
The Management of Anorectal Syndrome of Lymphogranuloma Inguinale M Edwards Baltimore—p 1194  
Multiple Echinococcus Cysts of Liver Treated by Operation and Arsphenamine Case L Rüdemaker, Salisbury, Md—p 1198  
Clinical Study of Advantages of Perennial Treatment of Hay Fever W C Spain and A M Fuchs New York—p 1199  
Fusospirochetal Infection of Lungs F M Duffy, Enid Okla.—p 1213  
Aspergillus Infection as Cause of External Ear Diseases R F Simms Richmond Va—p 1224  
Treatment of Massive Hemorrhage from Duodenal or Gastric Ulcer E D Luncheon and D N Issos Birmingham Ala—p 1228

**Prontosil in Treatment of Malaria**—Since August 1937 Hill and Goodwin have treated seven cases of *Plasmodium vivax* and ninety-three cases of *Plasmodium falciparum* with prontosil. In most of the cases the medication was given intramuscularly, 10 cc per injection, injections being made every twelve hours. It is believed that the intramuscular route is the best method, owing to the slower absorption of the drug. It was seldom necessary to give more than four injections before a clinical cure was evident. Usually after a single injection there was marked improvement with the elimination of febrile attacks and two days after the completion of treatment, that is, after four injections of 10 cc each, the patient was able to return to work. To date there have been no recorded relapses, but two reinfections have occurred in twenty-nine and thirty-one days, respectively, after the completion of the first course of treatment. Treatment was repeated and these patients are again apparently cured. The more severe the symptoms, the more quickly did the drug act and were the symptoms alleviated. No by-effects were noticed and the employment of this drug is considered safe in treating infections of this type. It is suggested that other drugs of the chrysoidin group be tried. The chemical structure of the drug should be borne in mind as the commercial trade names are often misleading. The authors do not believe that the use of sulfamidamide is justified in the treatment of malaria because of the toxic effects associated with its use.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Experimental Pathology, London

18 423 494 (Dec.) 1937

- Importance of Calcium for Potassium Exchange of Tumor Cell A Lasnitzki—p 423  
Further Studies of Complement Fixation in Influenza Antigen Production in Egg Membrane Culture and Occurrence of Zone Phenomenon L Hoyle and R W Fairbrother—p 425  
\*Active Immunization Against Experimental Influenza Use of Heat Killed Elementary Body Suspensions R W Fairbrother and L Hoyle—p 430  
Studies on Serologic Interrelationships of Rabbit Viruses Myxomatosis (Sanarelli 1898) and Fibroma (Shope 1932) J C G Ledingham—p 436  
Alleged Antitoxic Action of Vitamin C in Diphtheria S S Zilva—p 449  
Further Studies of Agent of Rous Fowl Sarcoma (A) Ultracentrifugation Experiments (B) Experiments with Lipoid Fraction E M Fraenkel and C A Mawson—p 454  
Preparation and Comparison of Different Types of Antityphoid Serums Agglutinins—Mouse Protection and Preliminary Clinical Trials E Grasset and W Lewin—p 460  
Hay Fever Skin Reactive Potency of Protein and Carbohydrate Fractions of Timothy Pollen D Harley—p 469  
Observations on Bacillus Welchii Type D Its Occurrence in Normal Animals and Variation in Antigenic Character of Its Toxin G R Borthwick—p 475  
Cultivation of Rabies Virus in Tissue Cultures H Bernkopf and I J Kligler—p 481  
Influenza Virus Infection of Rats and Guinea Pigs C H Stuart Harris—p 485

## Active Immunization Against Experimental Influenza

—Mice can be completely, and ferrets partially, immunized against influenzal infection by the injection of living or formalized virus. Attempts have also been made to immunize man, but the results obtained have been inconclusive. It has recently been shown by Fairbrother and Hoyle that the influenza virus has a complex antigenic structure and it seemed an important point to determine the most suitable type of antigen for use in vaccination. Studies have therefore been made of the immunogenic properties of various preparations. The results indicate that elementary body suspensions prepared by differential centrifugation contain the effective immunogenic fraction of the influenza virus and are capable of inducing complete immunity in mice. These preparations are largely free from extraneous protein and would therefore be more suitable for use in human prophylaxis than the preparations employed previously. Although live virus has been employed in human prophylaxis without ill effect (Francis and Magill, 1937), the experience of Shope (1936) with the swine virus suggests that the use of live virus may not be without danger. The authors' results show that in the experimental animal elementary body suspensions killed by heating at 57 C for thirty minutes, and preserved by the addition of 0.5 per cent phenol, have an immunizing power equal to that of live virus. Such suspensions would therefore seem most suitable for human use. While these suspensions are satisfactory prophylactics in mice, the immunization of ferrets appears to be much more difficult. As the disease in ferrets resembles the human disease much more closely than does the disease in mice, it might be thought that the outlook for human preventive vaccination was poor. However in testing for immunity in ferrets the animal is subjected to the intranasal inoculation under ether anesthesia of an enormous dose of virus, a test of a severity that would never be encountered under natural conditions by man.

## Edinburgh Medical Journal

44 733 814 (Dec.) 1937

- Threatened Gangrene Study of Case Exhibiting Signs and Symptoms of Obstructive Disease of Peripheral Circulation J Fraser—p 733  
Clinical Recollections and Reflections N. Rest in Bed A Patrick—p 750  
The Outlook on Cancer J J M Shaw—p 758  
\*Recurring Arthritis of Hip Associated with Acetonemia D Engel—p 780

## Arthritis of Hip Associated with Acetonemia—Engel

gives the history of a case of a recurrent condition of the hip joint in a child aged 3 years imitating clinically to a certain extent a coxitis and showing some unmistakable relationship to a coexistent recurrent acetone vomiting. A vomiting attack always occurred at the end of an arthritic period and

always brought with it relief of the joint trouble for several months. After an interval of fourteen years, he has reexamined the patient and made x-ray studies. The result of the last examination seems to justify his original presumption that there is a causal connection between the disease and the pathologic metabolism (acetonemia). It seems that other types of pathologic metabolism may affect the joints, a fact which has not been sufficiently considered in the pathologic studies of joint. The question is raised whether toxic substances (acetone acetoacetic acid, and the like) prevalent in recurring vomiting may have an elective affinity for articular cartilage, similar to the affinity of homogentisic acid in ochronosis (alkaptonuria).

## Indian Medical Gazette, Calcutta

72 649 712 (Nov.) 1937

- Incidence of Clostridium Tetani in the Soil of Calcutta C. L. Pasricha and G. Panja—p 649  
\*Further Experience with Tetrachlorethylene P. A. Maplestone and A. K. Mukerji—p 650  
Nontuberculous Affections of Lungs Confused with Pulmonary Tuberculosis Y. G. Shrikhande—p 653  
Note on Case of Brucella Abortus Infection in Aden E. S. Phopha—p 656  
Study of Commercial Bacteriophages I. Bacteriophages Active Against the Dysentery Group of Organisms C. L. Pasricha, M. N. Lahiri, S. K. Gupta and D. N. Chatterjee—p 659  
Types of Typhoidphage and a Note on Protective Value of Typhoidphage in Animal Experiments C. L. Pasricha, M. N. Lahiri and D. N. Chatterjee—p 664  
Races of Anopheles Stephensi Liston 1901 W. C. Sweet and B. A. Rao—p 665  
A Modified Village Mosquito Trap R. N. Gore—p 674  
Epidemic Dropsy in Cawnpore (U. P.) N. D. Banerji—p 675  
The Problem of Cancer M. G. Kim and K. V. Subba Rao—p 677

**Experience with Tetrachlorethylene**—Maplestone and Mukerji's recent figures record 62 per cent of cures in hookworm infestation treated with tetrachlorethylene. Their former results gave only 20.7 per cent of cures. From the results of 186 cases of hookworm infestation it appears that tetrachlorethylene in doses of 4 cc is slightly better than 3 cc. combined with 1 cc of oil of chenopodium. Tetrachlorethylene was used in the treatment of twenty-six cases of Taenia solium and Taenia saginata infestation. Four of the patients passed head after treatment and nine others reported from three to five months after discharge from the hospital with three exceptions there had been no recurrence, that is, out of thirteen cases traced ten were cured. Forty-two cases of Enterobius vermicularis infestation were treated and twenty seven, or 64.3 per cent, were cured with one treatment.

## Journal Obst &amp; Gynaec of Brit Empire, Manchester

44 997 1180 (Dec.) 1937

- Maternal Mortality in Hospital Practice H. I. McClure—p 997  
Analysis of 496 Private Obstetric Cases C. H. G. Macafee—p 1007  
\*An Exact Method of Determining Ovulation and Pregnancy J. Samuel—p 1036  
Intra Abdominal Pressure in Pregnancy Newly Considered R. H. Larrimore—p 1056  
Immediate Cause of Menstruation J. Beatty—p 1080  
Large Ovarian Cyst H. A. Kidd—p 1089  
Method of Performing Lower Segment Cesarean Section with Especial Reference to a New Compressor Instrument H. B. Butler—p 1091  
Cross Section of Perineum Simple Method of Limiting Rupture of Labor R. K. Howat—p 1094  
Surgical Treatment of Cysts of the Vulva and Vagina J. R. Gervill and F. L. MacPhail—p 1097  
Fibroma of the Ovary Clinical Study Muriel B. McIlraith—p 1107  
Radiograms Taken During Labor from Its Onset Until the Head is Born Indicating the Position of the Anterior and Posterior Shoulder N. A. Purandare—p 1109

**Method of Determining Ovulation Time and Pregnancy**—Samuels endeavored to discover how the reduction figures taken daily of the oxyhemoglobin test before and after menstruation stand in relation to each other in normal women. These figures during the cycle of a woman showed typical oscillations, by which the increase and decrease of the basal metabolism was shown as an index of the hormone level before, during and after menstruation and during ovulation. He used a cycloscope which consists of a spectroscopic lens, a rubber or metal cushions which press on the interdigital web, stopping the circulation each with an opening of 6 mm. a pair of forceps and a light of about 150 candle power (an ordinary show window lamp with a mercury mirror). The basic of the method is as follows. One of the interdigital web preferentially

that between the thumb and index finger, is clamped off by means of the fenestrated pelotte of the cycloscope, inducing a temporary interruption of the circulation, measuring about 6 mm. Spectroscopic examination of this section of the tissues in good illumination shows in the yellow and green portions of the spectrum two sharply defined dark absorption bands—those of oxyhemoglobin—between which is found a sharply defined light yellow band. After a short time the dark bands become indefinite, fade away and finally disappear. In the place of these bands, separated by an interval of yellow, there appears a broad, gray homogeneous band. At this point reduction of the oxyhemoglobin has been completed. The tissue which is being examined has combined with the oxygen of the oxyhemoglobin (tissue respiration). The reduction time may be taken in two or three successive observations for accuracy and the average computed. After from five to seven seconds, two new bands are to be seen, lying somewhat more closely to each other, i. e., separated by a narrower yellow-green space. The whole picture is less distinct and lies more to the left of the spectrum than the oxyhemoglobin bands. These are the absorption bands of methemoglobin. If conditions are further observed, it is seen that the methemoglobin bands again disappear with a rapidity which varies in different persons (from ten to forty seconds). This sequence of events is repeated several times at a quicker rate (tissue respiration). After the reduction time has been measured the constriction is released, so that the circulation is restored and there is a sudden reappearance of the oxyhemoglobin bands with the broad yellow band in between. It is advisable when making a number of successive counts not to clamp the same place each time. Thus the cycle curve, the ovulation time and pregnancy can be determined. In normal subjects with a balanced endocrine system the reduction time is about 150 seconds. With men and women in the climacteric, the reduction figures, taken daily, are constantly around 145 seconds. In a sexually mature woman these figures are apt to oscillate. If the reduction figure is ascertained every day for one month in a woman in the prime of her sexual life with a cycle duration of twenty-eight days, such a cyclogram shows three declines, of which one, the decline of the menstruation, is most pronounced. The two other declines are shorter in duration and deviate slightly. In abdominal operations performed after the ovulation decline had been observed with the aid of the cycloscope, a recently burst graafian follicle was always seen. This method of examination has proved that a woman releases at least two ova during one cycle. By the use of the cycloscope the day on which a woman ovulates can be determined accurately. In the cyclogram the menstruation decline, the first highest preovular position, the first ovulation decline, the second highest preovular position, the second ovulation decline and the highest premenstrual position are recognized. In pregnancy the cycle oscillations cease. Therefore pregnancy can be diagnosed, since the daily reduction figures always remain constant. In case of an early pregnancy in a healthy woman with a balanced endocrine system, daily constant reduction figures of from 155 (youthful gravid women) to 165 are found. From the second till the seventh or eighth month this figure is constantly around 160, rising toward the end of the pregnancy to 155. Shortly before delivery these figures drop to around 165, often showing oscillations immediately before the birth of the child. By this simple method the differential diagnosis between fibromyoma and pregnancy can easily be made.

**Cross Section of Perineum**—Howat points out that, the vaginal orifice being distended, the smallest critical plane pertaining to the particular presentation being secured and a favorable rate of advance obtained, any rupture that ensues will be inevitable and will occur in or near the middle line. Once started, the rupture is fully occupied by the advancing head, which thrusts its edges apart and at the same time presses downward on the perineum. Thus three divergent forces acting in planes at nearly right angles to one another bear simultaneously on the apex of the rupture a condition preeminently favorable to extension of the tear. If now a transverse incision is made through the entire thickness of the perineum with its midpoint at the line of the rupture produced, the rupture on extending will run into and be stopped by this cut and a new

and artificial perineal edge will be provided along which the ruptive forces will distribute themselves instead of being focused at the apex of a receding angle. The length of the incision must depend on the circumstances of the particular case. It should be just long enough to afford such distribution of the ruptive forces as will give reasonable security against the starting of a fresh rupture. Such an incision avoids division of muscle. Cross section is never superfluous because it is performed only after rupture has begun, it does not facilitate extension of rupture but checks it, it does not involve division of muscle, it is a clean cut made with a knife. These features would seem to entitle it to a place in the management of the perineum.

### Journal of Tropical Medicine and Hygiene, London

40 313 332 (Dec 15) 1937

- Preliminary Report on Two Pathogenic Fungi *Trichophyton Dankalien* e N Sp and *Sporotrichum Anglicum* N Sp A Castellani—p 313  
Bilharzia Disease F G Cawston—p 318  
Possibility of Toxin Production by Symbiosis E T Thompson—p 322  
Diseases of Skin in Negroes L J A Loewenthal—p 324

### Lancet, London

2 1415 1468 (Dec 18) 1937

- The Problem of the Gallbladder C P G Wikeley—p 1413  
Shock and Allied Conditions Survey J W Tomb—p 1416  
Pellagra like Lesions Produced in Mice by Mineral Deficiencies C M Leutsky—p 1421  
Tuberculosis of the Spleen G C Pether—p 1423  
Pulmonary Regurgitation G Bourne—p 1427  
\*Nutrition Surveys Simplified Procedure for Vitamin C Urine Test L J Harris and M A Abbasy—p 1429

**Simplified Procedure for Vitamin C Urine Test**—In examining large groups of subjects, the collection of urine during a period of twenty-four hours may be inconvenient. Harris and Abbasy have found the following procedure satisfactory and sufficiently accurate for routine surveys. At 9 a m the subjects to be examined are instructed to empty their bladders into the bottles provided (this specimen of urine is discarded) and then not to urinate until 12 noon, when a second specimen is obtained. This specimen is then titrated. The same program is repeated on a second (and/or third) day. Following this, for one or two further days (or more if found necessary) the standardized test doses (70 mg of cevitamic acid to each 14 pounds [6.7 Kg] of body weight) are administered at about 10 o'clock and urine is collected on the same afternoon at from 2 to 5 o'clock. Control tests have been carried out on large groups of volunteers kept on various graded levels of intake and prove that the three hour morning specimen of urine represents with sufficient accuracy about one eighth of the total day's excretion—and hence furnishes a record of the "resting level"—and that the collection of the two hours or three hours afternoon specimen is adequate to show whether or not there has been any marked response to the successive days' test doses.

### South African Medical Journal, Cape Town

11 827 858 (Dec 11) 1937

- Simple Detachment of Retina L Staz—p 829  
Analysis of the Health Conditions in a Small South African Town J Henson—p 833  
Dentistry and Dietetics L W Smith—p 835  
Diverticulosis of the Small Intestine R S Verster—p 838  
Indications for Mastoidectomy J D Wicht—p 841

### Journal of Oriental Medicine, Mukden, Manchoukuo

27 125 140 (Dec) 1937

- Pharmacologic Study of Toad's Ovarial Poison Parts III to IV T Mineshita—p 125  
Studies of Enzyme Actions of Pulmonary Tissue Preliminary Report S Izumi T Tanaka and T Takano—p 131  
Carbon Dioxide of Blood and Cerebrospinal Fluid in Normal Nurslings T Tanaka and S Okuda—p 133  
Relation Between Endemic Goiter in Jehol District and Iodine Content in Principal Food Produced in That District Part I Iodine Content in Vegetables from Goitrous and Nongoitrous Regions U Takei—p 134  
Id Part II Iodine Content in Grains from Goitrous and Nongoitrous Region U Takei—p 136  
Pathologic Anatomic and Histologic Study of Smallpox. T Kamimura—p 137  
Adsorption of Specific Precipitable Substance in Blood Part IV Experiments with Antifowl Hemoglobin Precipitin Wang Shib Hong—p 139

**Bull et Mém de la Soc Med des Hôpitaux de Paris**

53 1641 1667 (Dec 27) 1937

- \*Treatment of Tetanus by Intravenous Injections of Alcohol Combined with Massive Serotherapy E Merle François and Jouve—p 1642  
Local Tetanus in Subdelirious Alcoholic Crisis of 'Delirium Tremens' Following Intravenous Alcohol Therapy Disappearance of Contracture After Cure of Delirium M E Merle—p 1649  
\*Gonococcic Rheumatism Treated by Para-Amino-Phenyl Sulfamide M Brule P Hillemand and L Vilde—p 1650

**Treatment of Tetanus by Alcohol and Serum**—Merle and his associates point out that formerly the serotherapy of tetanus was used in combination with chloroform or other anesthesia. They show that the repeated administration of chloroform may produce a toxic hepatitis. This is especially undesirable in view of the fact that many of the patients with tetanus are of an advanced age and many are alcoholic addicts. Having observed two fatal cases following the combination of serotherapy and chloroformization, the authors decided to employ the intravenous injection of alcohol in combination with the serotherapy of tetanus. They describe their observations with this therapy in ten cases. They injected the antitetanic serum almost exclusively by the subcutaneous and the intramuscular route, only exceptionally by the intravenous route. They entirely refrained from the intraspinal injection of serum. The intravenous injections of alcohol were given daily in doses of from 10 to 40 cc until improvement was observable. A 33 per cent alcohol was used and was combined with a hypertonic (30 per cent) solution of dextrose, the sclerosing action of which is less than that of a combination of 33 per cent alcohol with isotonic solution of sodium chloride. The injections never caused the slightest complications. Seven of the ten cases were cured. Death occurred in two of the three fatal cases because of complications after the tetanus had apparently been cured. The third patient died within forty-eight hours from an acute bronchopneumonia, which appeared the day after a single chloroformization, which was necessitated by the cleaning out of the port of entry, this patient was an alcoholic addict, whose general condition was greatly impaired. None of the patients succumbed to the tetanus as such.

**Para-Amino-Phenyl Sulfamide in Treatment of Gonococcic Rheumatism**—Brule and his associates report two cases of gonococcic rheumatism in which they resorted to treatment with para-amino phenyl sulfamide. In the first patient the result was astonishing and rapid. After two days of treatment with the substance, the patient's condition was completely changed, although the symptoms had proved refractory to all other therapeutic measures. Two relapses, which appeared when medication with para-amino-phenyl sulfamide had to be interrupted for lack of a sufficient supply, disappeared again when the treatment was resumed. The second patient, who had had gonorrhea, developed orchitis and severe arthralgia. He was given daily 2 Gm of para-amino phenyl sulfamide and after two days the articular pains disappeared and resolution of the orchitis was observed. In a third patient, who had gonococcic rheumatism with a pseudophlegmonous involvement of the left knee, the chemotherapy was rapidly effective, but in spite of the continuation of the treatment there was a relapse with an increase in temperature, and a hydrarthrosis developed on the opposite side. The three patients showed no anomalies in the blood and in the renal function.

**Presse Medicale, Paris**

46 41 56 (Jan 8) 1938

- Reactions of Gallbladder E Chirbol and A Bussan—p 41  
\*Pseudotuberculosis in Human Subjects E. Dujardin Beaumetz, B Ballet and J Cebon—p 43  
Immunization Against Experimental Cancer by Intracutaneous Vaccinations S Wilner and S Zakrzewski—p 45

**Pseudotuberculosis**—Dujardin-Beaumetz and his associates discuss pseudotuberculosis of rodents and the pathogenic agent, the coccobacillus discovered by Malassez and Vignal. The authors say that this disease is frequent in guinea pigs and rabbits, from which human subjects may contract it. Transmitted by the digestive tract, it is characterized by the presence of miliary nodules in some of the visceral organs, particularly the spleen, and, in the natural disease, by engorgement of the mesenteric lymph nodes. Spontaneous pseudotuberculosis in laboratory animals may be the cause of errors since its lesions

may simulate those of tuberculosis. The authors review the literature on pseudotuberculosis in human subjects, pointing out that such reports are extremely rare. They describe a case which they observed. In human subjects the infection with the pseudotuberculous bacillus presents the clinical aspects of typhoid. It is generally accompanied by icterus and, as in the reported case, it usually ends in death. The characteristic lesions are hypertrophy of the spleen and liver, the parenchyma of which is filled with nodules, tumefaction of the closed follicle and Payer's plaques. The coccobacillus can be demonstrated by hemoculture and by culture of the splenic pulp and of the hepatic nodules. Inoculation of the cultures into guinea pigs produce in these animals the typical signs of pseudotuberculosis. The authors suggest that pseudotuberculosis might be more frequent than is suspected and that it might frequently be mistaken for typhoid.

**Schweizerische medizinische Wochenschrift, Basel**

67 1225 1248 (Dec 25) 1937

- Psittacosis and Methods of Combating It K F Meyer—p 1225  
Incidence and Treatment of Poliomyelitis in 1936 H Willi—p 1227  
Different Forms of Anorexia P Godard—p 1233  
\*Hyperostosis Frontalis Interna Clinical Signs and Associated Symptom F Morel—p 1235  
\*Misuse of Trichlorethylene by Youths for Hypnotic Purposes A Jerdi—p 1238

**Hyperostosis Frontalis Interna**—Morel directs attention to a condition characterized by a hyperostosis of the internal surface of the frontal region of the cranium. Reports have appeared in different countries, those made by Sherwood Moore of St Louis are based on an especially large material. Morel observed thirty-six cases. The disorder consists in a progressive thickening of the internal surface of the frontal bone. The external table of the cranium is not changed. The thickness of the diploe is doubled, tripled or even more increased. The internal table, which nearly preserves its original thickness, presents protuberances, arranged more or less radially round an umbilication, and this in a rigorously symmetrical manner on each side of the falx cerebri gives to this hyperostosis its absolutely typical aspect. As the hyperostosis increases the cranial capacity decreases. Hyperostosis frontalis interna is always accompanied by disorders which can be classified into cerebral disorders and endocranial disorders. Moore discovered that among patients admitted to general hospitals the incidence of hyperostosis frontalis interna was only 0.014 per cent but that it was 1.44 per cent among patients admitted to neuropsychiatric hospitals. This great difference in incidence is not a mere accident. The cerebral disorders associated with hyperostosis frontalis interna involve especially the anterior segment of the brain, which undergoes severe atrophy. The most frequent of these disorders is simple senile dementia with considerable frontal atrophy and the histologic changes characteristic of this disorder. But hyperostosis frontalis interna is found associated also with Pick's disease, Alzheimer's disease, cerebral arteriosclerosis and certain forms of dementia praecox, quite advanced and complicated by obesity and grave endocrine disorders. However, hyperostosis frontalis is not necessarily accompanied with considerable atrophy of the anterior region of the brain. Other cerebral disorders that are found among patients with hyperostosis frontalis interna are epileptic crises, vertigo, migraine and attacks of cerebral allergy. The obesity which is symmetrical, does not involve the face or the extremities, otherwise it involves practically the entire body, especially the breasts, which may reach down to the umbilicus. Other signs of endocrinopathy are hirsutism, especially on the clitoris, menstruation is frequently impaired. The author observed a case of obese eunuchoidism in which there existed hyperostosis frontalis interna, cerebral disorders and epileptic crises. There is no specific treatment for the disorder in its entirety, the cerebral disorders, the endocrine disturbances and the metabolic defects must all be treated separately. Against the paroxysmal headaches that accompany hyperostosis it might perhaps be possible to employ decompression by means of a large frontal trephination.

**Misuse of Trichlorethylene**—Jordi observed a case of addiction to trichlorethylene in a boy, aged 15 years. The boy and others had become acquainted with this use of trichlorethylene through a mechanic who had discovered it.

somniferous effects of trichlorethylene while using this substance in his shop. This youth practiced hypnotism and in order to make his subjects more readily succumb to sleep he used trichlorethylene, the unpleasant odor of which had been disguised by the addition of other substances, particularly amyl acetate. Many of the youths who had once been subjected to trichlorethylene had a desire for more, as it produced somnolence, euphoria and jocularly, moreover it increased the physical powers and reduced psychic restraints. To be sure, the substance may also produce general nervous irritations, such as convulsions and attacks of mania. The author discusses measures that should be taken to prevent the criminal misuse of trichlorethylene and the protection against the substance in its industrial employment.

### Annali di Ostetricia e Ginecologia, Milan

59 1247 1380 (Nov. 30) 1937

- \*Hysterosalpingography in Diagnosis of Extra-Uterine Pregnancy. E. Bortini—p. 1247  
Modifications of Urine in Menstrual Cycle and in Puerperium. F. Putzu Donneddu—p. 1297  
Congenital Cyst of Adrenal Gland in Monster Fetus. Possible Relation to Splachnocyctic Dysencephalia. Case U. Ciulla—p. 1327  
Short Wave Irradiations (Marconitherapy) in Hypogalactia. V. Dogliotti—p. 1347

**Hysterosalpingography in Diagnosis of Extra-Uterine Pregnancy**—Bortini says that the early diagnosis of extra-uterine pregnancy can be made by hysterosalpingography. The uterus appears in the hysterosalpingogram of extra-uterine pregnancy as a triangular or slightly round dark homogeneous shadow. In cases of abdominal, ovarian and advanced tubal pregnancy the uterus is displaced downward and to the side opposite that in which pregnancy takes place. In rare cases the uterus follows the pregnant sac upward. In recent tubal pregnancy the uterus is slightly deviated or not deviated at all. If there is a large hematocoele behind in front or lateral to the uterus, the latter appears, respectively, high at the center of the pelvis against the pubic symphysis, or low and posteriorly as if it were at the sacral cavity near the posterior pelvic wall or deviated opposite to the pregnant side. In primary abdominal pregnancy both fallopian tubes are open. In secondary abdominal pregnancy the fallopian tube on the side on which the egg originated is completely or nearly closed. In ovarian pregnancy one or both tubes are open. The pregnant ovary moves. The ampullar segment of the oviduct is enlarged in ampullar pregnancy, in which there are special aspects because of the distribution of the opaque substance. Some varieties of the aspects are seen in interstitial and isthmic pregnancy. Hysterosalpingography has not been done up to now in intra-uterine pregnancy coexisting with extra-uterine pregnancy. Hysterosalpingography is a dangerous procedure. Rupture of the tubes may complicate it. It can be resorted to only in the case of difficult diagnosis when other clinical symptoms have failed. Care must be taken to preserve asepsis and to prevent rupture of the tubes, in which case the hospital should be prepared for an emergency operation.

**Short Wave Irradiations in Hypogalactia**—Dogliotti applied short wave irradiations to 108 mothers who had hypogalactia. The majority of the patients were in the first month of the puerperium. In eighteen cases the treatment was given to mothers within three to five months after parturition. The treatment consisted of irradiations to both breasts, given daily with an apparatus of from 200 to 1,000 watts. The wavelengths varied from 6 to 30 meters. One rubber electrode was placed on each breast to produce a marked thermic effect. Each application lasted for twenty minutes up to a total of ten or twenty irradiations. The results were verified by the weight of the infant, who was weighed for several days in the course of the treatment and before it and immediately before and after nursing. The amount of milk increased to twice the amount before treatment after ten irradiations in 74 per cent of the cases (eighty mothers) and after twenty irradiations in 11 per cent of the cases (twelve mothers). The women reported a sensation of fullness of the breasts after the first four or six irradiations. In sixteen mothers the amount of milk did not vary. In no case did the amount of milk diminish during or

after the treatment. The satisfactory results last through the nursing period. The author believes that the irradiations stimulate the secretory functions of the breasts by stimulating ovarian and prehypophyseal substances.

### Giornale di Batteriologia e Immunologia, Turin

19 577 720 (Nov.) 1937 Partial Index

- Experimental Active Immunization by Intravenous Route with Various Types of Vaccine (Lysates and Phenol and Formaldehyde Vaccines). P. Cotrufo—p. 577  
\*Influence of Various Carbohydrates on Development of Processes in Course of Active Specific Immunization. P. Cotrufo—p. 593  
Cultures in Colloidal Medium According to Kłodnizsky. P. Cotrufo—p. 603  
Differentiation of Brucella by Cultures on Egg Medium and by Non-specific Agglutination. P. Cotrufo—p. 611

**Influence of Carbohydrates on Development of Immunity**—Cotrufo experimented on rabbits in the course of specific immunization against *Eberthella typhi*. The author concludes that carbohydrates, especially dextrose, increase the organic defenses and stimulate the function of the cells and the processes of specific immunization. The power of agglutination and of fixation of the complement are favorably modified by administering daily hypodermoclysis of isotonic solutions of saccharose or lactose to the animals in the course of specific immunization. The administration of hypodermoclysis of mannitol has a slightly favorable effect or no effect at all on the development of processes of immunization. The effects of saccharose and lactose are due to an organic reaction during which dextrose from saccharose and lactose, is set free and used by the body in stimulating humoral immunity. The treatment aims at stimulating nonspecific cellular and specific organic and humoral reactions and at increasing the effects of a specific treatment against the given infection.

### Folia Medica, Naples

23 1039 1094 (Oct. 15) 1937

- \*Action of Galactose on Diuresis in Liver Diseases. A. Gugliucci—p. 1061

**Action of Galactose on Diuresis in Diseases of Liver**—Gugliucci points out the role of the liver in the regulation of the metabolism of water. He noted the behavior of diuresis and hydremia in eleven patients who suffered from diseases of the liver of different intensity before and after the administration of 200 cc of water containing 40 Gm of galactose. The patients received every morning, for four or five consecutive days before the test, 200 cc of water so as to have a well balanced water metabolism. The test was performed during a period of fasting. The author concludes that galactose diminishes diuresis and increases hydremia in patients suffering from atrophic cirrhosis. The diminution of diuresis is intense during the first four hours in the course of the test and lasts all day. Diuresis and the amount of water in the blood do not change in patients who are suffering from diseases of the liver other than atrophic cirrhosis (catarrhal jaundice, postinfectious hepatomegaly, hepatitis from cholecystitis or syphilis and blastoma of the liver). As to the frequency of the diminution of diuresis in atrophic cirrhosis and the relation of the phenomenon to the function of the liver and to hydremia conclusions cannot be drawn. According to the author, galactose administration causes a temporary aggravation of the insufficiency of the liver with consequent disturbance of the metabolism of water. As insufficiency is more intense in atrophic cirrhosis than in other diseases of the liver, the functional reaction and the consequent metabolic disorders are intense in atrophic cirrhosis, as shown by the increased hydremia and diminished diuresis of the patients.

### Riforma Medica, Naples

53 1765 1804 (Dec. 11) 1937

- \*Behavior of Basal Metabolism in Syphilitic Mesoarthritis with Valvular Insufficiency. I. Di Prisco—p. 1767  
\*Vitamin C and Hemorrhagic Diseases. G. Ceruti and F. Costanzo—p. 1770  
Tuberculosis of Pubic Bone. A. Parini—p. 1796

**Basal Metabolism in Syphilitic Mesoarthritis**—Di Prisco points out the importance of following the behavior of the basal metabolism in patients who are suffering from syphilitic mesoarthritis with aortic insufficiency. An increased basal metabo-

lism shows decompensation which sometimes is not shown by certain tests (Martinet) of the heart functions. The determinations of the basal metabolism are of importance, especially in ascertaining the working capacity of the patients.

**Vitamin C and Hemorrhagic Diseases**—Ceruti and Costanzo studied the effects of an intravenous injection of 0.05 Gm of cevitamic acid on the constants of the blood of five normal persons and of five patients who were suffering from hemorrhagic diseases. In both groups the bleeding time and sedimentation speed of the erythrocytes diminished and the number of platelets did not change after the injection. The resistance of the capillaries increased in the patients and in the normal persons who had it slightly diminished. The coagulation time did not change in normal persons, whereas it diminished in patients who were suffering from hemorrhagic diseases. The authors point out that cevitamic acid has a different action on the coagulation time of normal persons and patients who have hemorrhagic diseases, owing to the fact that the coagulation time is prolonged in the course of the disease. Cevitamic acid has no direct action on coagulation of the blood. It improves the condition of the epithelium of the vessels, especially the capillaries which, in the course of hemorrhagic diseases, are in a hemorrhagiparous condition originating from insufficiency of cevitamic acid. The hemostatic action of cevitamic acid is symptomatic and indirect rather than etiologic and direct. In two patients who were suffering from nephritic and essential forms of hematuria, the administration of cevitamic acid controlled the disease. The treatment consisted in intravenous injections of 0.05 Gm each of cevitamic acid, which were given daily up to a total of ten or more injections. It was well tolerated. The satisfactory results were verified by microscopic studies of the urine.

### Revista Brasileira de Cirurgia, Rio de Janeiro

6 407 456 (Oct.) 1937

\*Simple Technic for Hemorrhoidectomy R Pitanga Santos—p 407  
Posttraumatic Encephalic Syndrome of Compression R Freire—p 435

**Simple Technic for Hemorrhoidectomy**—Pitanga Santos discusses the management of patients before and after hemorrhoidectomy and reports a simple technic from which he obtained satisfactory results in more than 460 cases. He advises against the administration of cathartics and enemas before operation. They irritate the rectal mucosa, increase the local septic conditions and cause postoperative complications. His technic is based on four principles: (1) excising internal hemorrhoids before the external ones, (2) seizing and excising internal hemorrhoids in a longitudinal direction, (3) not making any sutures after excision of the hemorrhoids and (4) not leaving any drain tube. The operation may be performed with procaine hydrochloride or spinal anesthesia. The technic is as follows: The anus is kept open by four Kocher forceps placed at cardinal points, and the internal hemorrhoids are seized by Kocher forceps and excised separately, the forceps being left in place as excision is carried on and then being removed in the same order in which they were applied. If there is slight bleeding at the internal angle of the wound, it is controlled by placing a hemostatic forceps there for a few minutes (rarely a ligature and never a suture point). The four forceps which held the anus open are then also removed and the surgical field retracts. The edges of the wounds of the internal hemorrhoids close normally as the excision followed a perpendicular direction to that of the fibers of the sphincter. The external hemorrhoids or congested anal folds are excised on both sides. The skin is removed at the point of excision and the subcutaneous cellular tissue is decoratified in accordance with the enlargement of the fold. Plastic reconstruction of the anus is then done without the placing of any suture. The anal canal is smeared with petrolatum immediately after the operation and for the ensuing four or five days. No drain is installed. If the coagulation time is retarded, a piece of gauze is left in the rectum for twenty-four hours and then removed. The patient is kept at rest in bed for twenty-four hours and is given nothing but liquids and fruit juices for two hours and is given nothing but liquids and fruit juices for two hours. A cathartic is given on the third or fourth day. Immediate and late complications, pain and retention of urine do not take place. The patients are discharged within four or five days.

### Semana Medica, Buenos Aires

45 156 (Jan 6) 1938 Partial Index

Indications and Contraindications of Partial Symphysiotomy E Zarr—p 2  
Heart in Pulmonary Tuberculosis M Pogorelsky—p 10  
Spermatic Veins Roentgen Study I Castillo Odona—p 24  
Grave Ulcerous Colitis M Manguel—p 28  
\*Titration and Dosage of Cobra Venom to Be Used for Pain in Cancer and Arterial Hypertension F Bagnasco P J Aguilar and A Garz—p 33  
Essential (Biologic) Treatment of Erysipelas D L Maffei—p 36

**Titration and Dosage of Cobra Venom**—Bagnasco and his collaborators state that the cobra venom to be used in the treatment of pain in cancer and arterial hypertension is prepared in solutions for intramuscular injections. The dose of venom in the solution is fixed by the biologic assay. The latter is based on the toxic (rat) and the physiologic hypotensive (rabbit) units, each of which contains from 0.00001 to 0.00002 Gm of the venom. Cobra venom does not have a cumulative action. The analgesic hypotensive, toxic and vascular effects are not related. To obtain satisfactory results from the treatment, the solutions have to be freshly prepared as they deteriorate in from six to eight months. It is advisable to ascertain the condition of the excretory and cardiac apparatus of the patients before administering the treatment. When the injections are given for the control of pain in cancer, the treatment begins with small doses (from 0.000005 to 0.00002 Gm) and rapidly increases in the next few injections to the largest dose, which is 0.0001 Gm. The same dose is given for the following injections, unless it fails to control the pain. It is then carefully increased. Fatal toxic doses for men vary from 0.0001 to 0.0015 Gm. The injections are repeated at varying intervals, according to the improvement of the patient, frequently at weekly or longer periods. Failure of the largest dose shows a refractory patient and the treatment is discontinued. The treatment controls pain in 70 per cent of the cases of cancer. The less satisfactory results are those obtained in patients having tumors which cause great compression. In the treatment of hypertension it is advisable to administer small doses (from 0.00001 to 0.00002 Gm). The physiologic hypotensive unit is given the preference. The injections are given first at weekly intervals and then at longer intervals, according to the condition of the blood pressure. The less satisfactory results are obtained in patients who have grave cardiac disturbances, aortitis or cardiac insufficiency, as well as when the first few injections diminish the arterial oscillations for the first thirty or sixty minutes following the injection. Failure of the first two or three injections shows a refractory patient. In all cases the dose must be watched carefully. The reactions which follow immediately or late after the treatment are not serious. The treatment is incompatible with the administration of iodine, of gold and silver salts and of radioactive substances. The treatment is used for pain in cancer, arterial hypertension, tabetic gastric crises, trigeminal neuralgia and epilepsy.

### Klinische Wochenschrift, Berlin

16 1737 1776 (Dec 11) 1937 Partial Index

Vitamin C Balance in Human Subjects K Wachholder and P Harel—p 1740  
Experimental B Hypervitaminosis (Lactoflavin Poisoning) in Rats W Weslaw B Wronski A Wroblewski and B Wroblewski—p 1746  
Experiences with Concentrated Serums for Demonstrations of Defective N Factor K W Claiberg—p 1749  
\*Modification of Electrocardiogram and Other Secondary Effects in Quinine Therapy R Aschenbrenner and Q Coda-Thompson—p 1750  
Primary Exudative Pleurisy F E Schmengler—p 1756  
\*Possibilities of Combined Insulin Metrazol Treatment of Schizophrenia A Erb—p 1762

**Modification of Electrocardiogram in Quinine Therapy**—Aschenbrenner and Coda-Thompson state that in earlier reports they directed attention to the fact that if the diagnosis of myocardial impairment is based on electrocardiographic changes it should not be overlooked that previous treatment with quinine or quinidine may lead to erroneous conclusions. In view of the increasing significance of electrocardiography for the recognition of myocardial involvement in acute infectious diseases, and in view of the rather extensive use of quinine in the treatment of pneumonia and influenza, the authors decided to investigate the modification of the electrocardiogram.



quinine therap and found that this medication may constitute a source of error To be sure, the electrocardiographic changes after medication with quinine are of lesser duration and severity than are the changes after medication with quimidine Moreover, the severity of the changes depends on the sensitivity of the individual patient to quinine The authors also discuss the harmful secondary effects of quinine on the heart and the circulation They emphasize that in the treatment of pneumonia and influenza the protection of the heart and the circulation are of primary importance and, since the intravenous administration is the most dangerous form of quinine therapy as regards the heart and circulation, even if it is given together with calcium they warn against it in these patients

**Combined Insulin-Metrazol Treatment of Schizophrenia**—Erb shows that the suggestion of a combined insulin-metrazol treatment of schizophrenia raises the question as to whether the negative results after metrazol or insulin can be reduced by trying the other substance or by employing the two substances simultaneously The author reports experiences with insulin and metrazol on the basis of which he evolved the following procedure for the combined treatment In cases of schizophrenia in which the psychomotor manifestations predominate (hypokinesia as well as hyperkinesia) he begins with injections of metrazol After a partial or temporary improvement has been obtained, the metrazol treatment is interrupted and the insulin treatment is begun In hebephrenia, the author begins with insulin treatment He resorts to metrazol only if after six or eight weeks of insulin treatment there is no psychic reaction whatever Following several metrazol injections, the insulin treatment is resumed In several cases of catatonic excitation the treatment was similar to that in hebephrenia In patients in whom 0.7 cc (in women 0.6) of metrazol does not produce a convulsion, insulin treatment is begun After the spasmophilic tendency has increased in the course of the insulin treatment, the treatment is continued as in hebephrenia

### Munchener medizinische Wochenschrift, Munich

84 1969 2008 (Dec 10) 1937 Partial Index

Significance of Rachitic Pelvis for Obstetric Practice of General Practitioner A Mayer—p 1969  
Cardiac Disturbances in Acute and Chronic Tonsillitides and Other Infections G W Parade—p 1971  
Functional Test of Circulation K E Rothschild—p 1975  
Functional Tests of Liver in Advanced Hepatic Cirrhoses G Walther—p 1978  
Experiences with Takata Reaction in Jaundice Five Hundred and Eighty Five Cases J Sommer—p 1979  
Solution of Diethylamine of Pyridine Betacarboxylic Acid in Alcohol Intoxication G Krull—p 1987

**Treatment of Alcohol Intoxication**—Kruhl resorted to the intravenous administration of 5 cc of a 25 per cent solution of diethylamine of pyridine betacarboxylic acid to improve the circulation of a man who was completely unconscious following excessive consumption of alcohol Shortly after the intravenous and the simultaneous intramuscular injection of the solution the man began to move, the respiration became deeper and more regular and the pulse became stronger and more regular Signs of stasis disappeared and the cyanotic color of the face subsided In the next half hour the patient was given two additional intravenous injections of 5 cc of the aforementioned solution After that he was able to stand up and walk In view of these favorable effects, the author employed the solution in similar cases He never administered more than 20 cc although the literature indicates that if the same preparation is employed in case of poisoning with hypnotics, it is given in larger quantities The injection results in attacks of sneezing because of irritation of the nasal mucosa by which the substance is eliminated

### Nervenzarzt, Berlin

10 601 650 (Dec 15) 1957

Limits of Heredostatistical Methods K Conrad—p 601  
Value of Meinicke Clarification Reaction for Diagnosis and Therapy of Neurosyphilis W Muller—p 606  
Plantar and Dorsal Reflex of Great Toe G W Kaetzel—p 614  
Korsakoff's Disease in Avitaminosis Resulting from Hyperemesis Gravidarum G Saker—p 619

**Meinicke Clarification Reaction in Neurosyphilis**—According to Muller the Meinicke clarification reaction has increased in favor in recent years because of its high spec-

ificity for syphilitic disorders In neurology, not only the Meinicke clarification reaction in the blood but also the Meinicke clarification reaction (II) in the cerebrospinal fluid has been found helpful In this report Muller gives his attention chiefly to cases of neurosyphilis in which a positive clarification reaction appears isolated either in the blood or in the cerebrospinal fluid and in which the Wassermann reaction is negative In nearly all of the 104 cases which the author evaluates here the blood as well as the cerebrospinal fluid was subjected to the Wassermann and to the Meinicke clarification tests In addition to this the cerebrospinal fluid was examined for its number of cells and protein content and the mastic test was made In summarizing the results of his studies the author stresses the following points 1 Isolated positive Meinicke clarification reactions in the blood or in the cerebrospinal fluid occur in all forms of neurosyphilis, in the active as well as in the inactive cases 2 The positive Meinicke clarification reaction in the cerebrospinal fluid and particularly in the blood is extremely resistant to therapy, and in some cases it never disappears 3 In case of an isolated positive Meinicke clarification reaction in the blood, even in case of entirely negative clinical aspects, the cerebrospinal fluid should always be subjected to a thorough examination to exclude an active process 4 The isolated clarification reaction in the blood as well as in the cerebrospinal fluid has a high specificity, except in cases in which the protein content of the cerebrospinal fluid is rather high The two reactions, in the blood and in the cerebrospinal fluid, are of equal value for the diagnosis of syphilis, even if their occurrence is isolated They are an indispensable part of the diagnostic aids in neurosyphilis 5 In deciding the therapeutic requirements of patients with isolated Meinicke clarification reaction, the changes in the cerebrospinal fluid, particularly as regards the protein content and cell count, are helpful 6 Patients with isolated positive Meinicke clarification reaction in the blood or the cerebrospinal fluid, but with negative clinical aspects and with practically normal cerebrospinal fluid, may be regarded as practically cured and do not require treatment

### Zeitschrift für experimentelle Medizin, Berlin

102 1 218 (Dec 17) 1937 Partial Index

Histologic Investigations on Modification of Vitamin C Content in Different Organs by Anesthetics H J Lauber H Dumke and A Patzschke—p 1  
Influence of Gonadotropic Prehormone of Pregnancy Urine on Sugar Metabolism F Hogler and F Zell—p 8  
\*Influence of Blockage of Parasympathetic on Reduction of Cholesterol Esters After Thyrotropic Hormone Thyroxine Diiodotyrosine and Iodine Thyropeptide E Fenz and F Zell—p 32  
\*Purine Content of Blood Serum in Healthy Persons and Patients J Weber and W Schuler—p 45  
Porphyrins and Serum Proteins Vehicle Function of Serum Protein Bodies H Gildemeister—p 58  
Actions of Nicotine on Hypophysis L H Strauss and P Scheer—p 102

**Reduction of Cholesterol Ester After Thyroid Extracts**—Fenz and Zell describe animal experiments on the effect of thyroid extracts on the cholesterol content of the blood They found that the intravenous injection into rabbits of thyrotropic hormone, thyroxine, diiodotyrosine or iodine-thyropeptide was followed by a reduction in the cholesterol ester In case of equal iodine content, thyroxine has a stronger effect than diiodotyrosine on the cholesterol ester This action, like the increase produced in the blood sugar and temperature, can be prevented by diencephalic narcosis as well as by blockage of the parasympathetic (atropine), that is it is produced by way of the diencephalic centers and the parasympathetic

**Purine Content of Blood Serum**—Weber and Schuler point out that the uric acid in the blood is derived from the decomposition of exogenous (taken in with the food) and endogenous (liberated by the cells) purine bodies Since the decomposition of the nucleoproteins is gradual, the serum contains mononucleotides, nucleosides, free purines and uric acid The authors report studies on the purine and nucleoside contents of the serum in healthy persons and in patients with various disorders They improved the method which Schuler and Reindel had developed for the quantitative determination of free purines and nucleosides in the serum They found that after a purine



free diet has been continued for three days, the normal purine value of the serum (expressed as uric acid) amounts to from 25 to 35 mg per hundred cubic centimeters. Exogenous oral intake of nucleoproteins results in a much more rapid and greater increase in the purine value than in the uric acid value. This increase in the purine value commences to subside again after two hours. The endogenous purine value of the serum was determined in a number of patients. Increased amounts were found in leukemias and in malignant tumors, probably as the result of the greater decomposition of nuclei. The increase in the purine content of the serum of patients with exophthalmic goiter is probably likewise caused by an increase in the breakdown of the cells. The authors discuss the cause and significance of augmented values in gout, organic heart diseases, articular disorders, epilepsy and progressive muscular dystrophy. In renal diseases, increased as well as decreased values were observed. The authors made some tests on the cerebrospinal fluid of healthy persons and of patients with organic diseases of the central nervous system for the presence of free purine and of nucleosides. They gained the impression that exogenically administered purine bodies have no influence on the purine content of the cerebrospinal fluid. The values detected in patients with diseases of the central nervous system are recorded in a table.

### Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

81 5991 6098 (Dec 18) 1937 Partial Index

Refractory Symptoms of Cystitis J A Weijlandt—p 5993

Circumscribed Glycogenic Cardiac Hypertrophy S van Creveld and H M van der Linde—p 6000

Cause of Eczema K Edel—p 6006

\*Insulin and Metrazol Treatment in Schizophrenia G W Kastein—p 6016

Botulism in the Netherlands A J R E van Schoonhoven van Beurden and A Clarenburg—p 6024

#### Insulin and Metrazol Treatment in Schizophrenia—

Kastein describes studies on rabbits on the mode of action of metrazol. He found that the increase in blood sugar following a metrazol convulsion is the result of the pharmacologic action of metrazol, of the nervous action of the attack and of the efferent impulses elicited by the attack. After repeated injections of metrazol, the sensitivity of the organism for metrazol, as measured by the incidence of convulsions, decreases. After an attack which is produced by a second injection following shortly after the first one, the recovery is delayed. Discussing the influence of metabolic changes on the action of metrazol, the author says that prolonged metabolic changes modify the sensitivity for metrazol, starvation reduces it slightly and retention of water increases it. Dehydration by means of salyrgan decreases the sensitivity to metrazol, as does also the administration of calcium. The gradually reduced sensitivity after frequently repeated injections of metrazol can be ascribed to possible general metabolic and vasomotor disturbances and to changes in the central nervous system.

### Finska Lakaresallskapetets Handlingar, Helsingfors

80 647 712 (Aug) 1937

So-Called Zygomaticomastoiditis and Its Treatment H Gadolin—p 647  
Treatment of Nephrosis and Therapy of Edema M C Ehrstrom—p 660

Retrograde Resorption of Urine C Wegelius—p 669

\*Serum Protein and Plasma Cells in Rubella H Groth—p 674

#### Serum Protein and Plasma Cells in Rubella—

Groth examined eighteen cases of rubella, in fourteen there were plasma cells in the peripheral blood and in sixteen more or less extensive swelling of the lymph nodes. No parallel was found between the number of plasma cells in the peripheral blood and in the sternal punctate. He says that the increase in plasma cells in the blood in rubella can hardly be ascribed to a medullary hyperplasia of plasma cells. Five of seventeen cases examined showed a hyperglobulinemia of from 325 to 538 per cent, this increased globulin was not parallel with the number of plasma cells in the blood or in the bone marrow. The view that plasma cells or reticulo-endothelial cells are important in globulin synthesis is not contradicted by this result. The elements morphologically designated as plasma cells can conceivably have a different origin and different biologic characteristics in different disorders and even in the same disorder.

### Norsk Magasin for Lægevidenskapen, Oslo

98 1451 1554 (Dec) 1937

\*Cancer of Lungs T Harbitz—p 1451

\*Hypochloremic Conditions O Jervell and A Jakobsen—p 1501  
Principles and Experiences Concerning Urography H Retan—p 1519

**Cancer of Lungs**—Of Harbitz's seventy five patients with pulmonary cancer forty were men and thirty five women and of the 353 deaths from pulmonary cancer reported in the official medical statistics of Norway from 1919 to 1934, 183 were men and 170 of women. He says that the protracted chronic pulmonary diseases of various kinds (not tuberculosis) often mentioned in the case reports might lead to the development of pulmonary cancer. A constitutional disposition also must be taken into consideration. In the bronchial forms of cancer of the lungs, probably the most frequent, there is a fairly circumscribed infiltration, usually centrally in the lung, more or less clearly connected with a bronchus, there may be a somewhat larger infiltrate with ulcerating grayish white tumor masses around the bronchus and narrowing its lumen, or an infiltrate toward the hilus, with standlike stripes on the walls of bronchi and blood vessels, often with stenosis, or in a larger bronchus toward the hilus a circumscribed polypoid, sometimes papillomatous, tumor of slow growth, at least at the start, relatively benign clinically, bordering on an adenoma (as in his patient, a boy aged 15) with stenosis and chronic bronchitis leading to bronchiectases. In the pneumonic types there is in some cases a diffuse infiltrating form affecting a lobe or the entire lung with lung tissue resembling that of a caseous tuberculous pneumonia, often with necrosis and formation of large cavities, or there may be a small circumscribed infiltrate in a lobe and caseous degeneration of the infiltrate, occasionally there is hemorrhagic pleuritis with grayish white tumor masses on the inside of the pleural cavity, usually with small superficial infiltration of the lung, and, finally, the so called mediastinal form with small infiltrate in the hilus, in which metastases to the lymph nodes in the hilus, along the trachea and in the connective tissue in the mediastinum dominate in the anatomic picture. The place of origin of pulmonary cancer is assumed to be in most cases in the bronchial epithelium. Microscopically a marked polymorphism is noted, with developed definite cell types and slightly differentiated cell forms. Metastases can be found in practically all organs. The author calls special attention to metastases to the central nervous system, which occurred in about one fourth of his patients, and to metastases to the bony system, which occurred about equally often. The twenty nine cases reported illustrate a number of the manifold combinations of metastases seen in pulmonary cancer.

**Hypochloremic Conditions**—Jervell and Jakobsen determined the chloride content of the serum in 185 patients and in twenty-five normal persons, in whom the values were from 311 to 385 mg per hundred cubic centimeters. They say that a diet deficient in salt appears more readily to be followed by hypochloremia in patients with hypertonia than in normal persons. Their investigations show (1) that hypochloremia is frequent in patients with hypertonia and renal disorders treated with a diet deficient in salt, (2) that administration of salt in such patients produces not only a rise in the amount of plasma chlorides but simultaneously a fall in azotemia and (3) that in some cases a parallel is seen between the rise in chloride and the decrease in the urea concentration. The azotemia after vomiting and intestinal hemorrhage is ascribed to a toxicosis with increased albumin degeneration. The authors conclude that it is harmful to give patients with chronic renal disturbances a diet strictly deficient in salt, except in cases of edema; further that treatment is facilitated by routine determination of the amount of plasma chloride simultaneously with determination of the urea concentration or the amount of nitrogen in the blood, and they advise these determinations in all cases of vomiting and intestinal hemorrhage, as the result will afford a guide as to how much salt and fluid to be administered. Whether the salt and fluid are to be given intravenously, subcutaneously, rectally or as a blood transfusion will depend on the nature of the case. In many cases it may be advisable also to administer dextrose.

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## CARCINOMA IN THE FIRST THREE DECADES OF LIFE

NORMAN HALL, M.D.  
AND  
JAMES W. BAGBY, M.D.  
ST. LOUIS

The old concept of cancer as a disease highly selective of the latter span of life is undoubtedly a factor that militates to no small degree against proper recognition of this disease. Furthermore the seeming tendency of cancer to manifest itself to an increasing degree during the earlier decades of life is a fact calling for more emphasis than is laid on it in current literature. For these reasons we have made this study of the material at the Barnard Free Skin and Cancer Hospital, where, since 1908, there have been 134 patients between 8½ and 31 years of age in whom the diagnosis of cancer was confirmed by microscopic examination.

This paper treats of carcinoma alone in patients of 30 years or younger. Sarcoma and other malignant conditions have not been included. The more one sees of cancer and studies it microscopically, the more is one convinced that occasional mistakes are made in the diagnosis of cancer. We feel that much confusion has arisen regarding end results and statistics in the incidence and treatment of cancer, owing to the fact that data are often given in instances of unproved (by microscopic examination) carcinoma. To obviate any such confusion and doubt we have in this paper divided our cases into two groups:

1 'Proved cases,' those in which a positive microscopic diagnosis was made

2 'Clinical cases,' those in which there was no report of microscopic examination (in many of which treatment had been by radium or cautery)

We feel sure that all, or practically all, of the cases placed in the second group (clinical cases) were carcinoma. The history and manifestations point to cancer many of the patients having had tumors removed previously with subsequent recurrence and many were later reported "dead of cancer." All these cases were diagnosed cancer by staff members who have had wide experience in this line of work. However we feel as already stated, that only cases determined by a microscopic report should be used in a statistical study, therefore in this paper although we give a list of the "clinical cases," all statistics are based on the "proved cases." Wherever we mention "duration" or "duration of symptoms" we refer to the period from the time

when the patient noticed the first symptom until he or she reported to the clinic.

Table 1 shows the occurrence of carcinoma in our cases (both proved and clinical) as well as the sex ratio. It will be seen that of the 134 cases which were proved by microscopic examination twenty-nine (21.6 per cent) occurred in males while 105 (78.4 per cent) were in females.

These 134 cases can be presented in detail statistically in most suitable fashion by classifying them according to the various organs, or groups of organs, involved in the disease as listed in table 1 under "site."

Table 2 shows that of the eleven patients with carcinoma confirmed microscopically the youngest was 22 years of age (there being three patients this age). Of those with "proved cancer" seven were males and four females. The duration, up to the time of admission to the hospital, varied from one month to twelve years, the average being two years.

Of the eleven patients, one died of cancer in less than one year (carcinoma of the ear with metastases to the parotid region) and one died following an appendectomy one year after treatment for cancer. Two had no recurrence for periods of under one and two years respectively. One had no recurrence after nine years and one had none after eleven years. Five of the cases have not been traced.

It will be seen from table 3 that, of the proved cases, the youngest patient with carcinoma of the nose was 22 years of age. Of the five patients four were males, one female. The duration of the disease, up to the time of admission to the hospital, varied from five weeks to eight years, the average being a little over two and one-half years.

Table 4 shows two proved cases of carcinoma of the upper lip, the younger patient being 25 years of age. The duration of these two cases was two and one-half and one and one-half years.

From examining table 5 it will be seen that of the ten proved cases, all occurring in males, the youngest patient was 19 years of age. The shortest duration (from the time the patient first noticed the lesion until he applied to the clinic) was two months. The longest duration was four years, the average for the ten patients was eighteen months. Seven of the patients had radical lip operations (Stewart operation or a modification). One had a V excision. One was treated by radium alone, he received several applications and had a rather severe reaction with enlargement of the submaxillary nodes. A suprahyoid dissection was advised, but he did not consent. One patient was not treated at the Barnard Hospital. Only one of the seven patients who had lymph nodes removed had metastases. He was first treated by radium and then underwent a radical lip operation, following which he has been clin-

ically cured for five years. Of the nine patients treated, three have been treated for a period of less than one year, three had no recurrence after a period of three years, one had no recurrence after five years, while one has gone for a period of eleven years without recurrence. One patient has not been traced.

TABLE 1—Occurrence of Carcinoma with Sex Ratio (Proved and Clinical Cases)

Site	Proved Cases (Microscopic Diagnosis)			Clinical Cases (No Microscopic Diagnosis)			Total Proved and Clinical
	No. of Cases	Males	Females	No. of Cases	Males	Females	
Face (other than nose or lips)	11	7	4	17	13	4	28
Nose	5	4	1	8	4	4	13
Upper lip	2	1	1	1	1	0	3
Lower lip	10	10	0	6	6	0	16
Mouth	4	1	3	2	2	0	6
Gastro intestinal tract	7	3	4	1	1	0	8
Breast	22	0	22	9	0	9	31
Extremities	5	1	4	0	0	0	5
Miscellaneous	2	0	2	0	0	0	2
Penis	0	0	0	1	1	0	1
Xeroderma pigmentosum with carcinoma							
tous changes	3	2	1	0	0	0	3
Gynecologic cancer (other than cervix)	6	0	6	1	0	1	7
Cervix uteri	57	0	57	26	0	26	83
Total	134	29	105	72	28	44	206

Of the cases of carcinoma of the mouth the shortest duration, from first symptoms to admission, was two and one-half months, the longest two years. The 21 year old woman with carcinoma of the tongue died three weeks after she was first seen. The other patient with carcinoma of the tongue died fourteen months after first applying for treatment. The tongue was treated with radium and she had a bilateral dissection of the neck for metastases. The boy with carcinoma of the throat had cervical metastases on admission and died

TABLE 2—Carcinoma of the Face

Site	Eleven Proved Cases			Tumor Type
	Age	Sex		
Outer canthus	30	♂		Squamous cell grade 2
Eye lid	28	♀		Basosquamous
Multiple	22	♀		Basal cell
Skin of parotid region	25	♂		Squamous cell, grade 3
Cheek	22	♂		Squamous cell
	30	♀		Squamous cell
Temple	30	♂		Squamous cell grade 1
	26	♂		Melanocarcinoma
Ear	22	♀		Squamous cell
Skin of neck	30	♂		Basal cell
Face	28	♂		Squamous cell
Site	Seventeen Clinical Cases			Sex
	Age			
Cheek (3)	22 (2)			♂ (2)
	29			♂
Forehead (2)	18			♂
	29			♂
Face (11)	22 (2)			♂ ♀
	25			♂
	27			♂
	29 (4)			♂ (4)
	30 (2)			♀ (2)
	30			♂
Skin chin	29			♀

within two and one-half months. The 24 year old woman with nasopharyngeal carcinoma now has extensive metastases in spite of roentgen therapy and dissection of the neck.

The 28 year old man with adenocarcinoma (grade 2) of the stomach had a partial gastric resection else-

where, was treated here by roentgen rays and died within six months of the operation. The carcinoma of the ampulla of Vater was of three months' duration and the patient died within four months after first applying for treatment. The woman with carcinoma of the colon went elsewhere and it has been impossible to get a follow-up. Of the three rectal cases, durations were given as one month, five months and one year. One patient died within three months, one died post operatively and one has had an artificial anus for six months. The latter has had a large dose of radium and roentgen rays, is inoperable and is doing poorly. The 30 year old woman with squamous cell carcinoma (grade 3) of the anus was operated on one and one half years ago, and so far there are no signs of metastases.

TABLE 3—Carcinoma of the Nose

Five Proved Cases			Eight Clinical Cases	
Age	Sex	Tumor Type	Age	Sex
22	♂	Squamous cell grade 1	21	♀
25	♀	Basal cell	22	♀
27	♂	Basal cell	24	♂
27	♂	Hair follicle carcinoma	26	♂
30	♂	Basosquamous	30 (4)	♂ (2) ♀ (2)

TABLE 4—Carcinoma of Upper Lip

Two Proved Cases			One Clinical Case	
Age	Sex	Tumor Type	Age	Sex
25	♀	Basal cell	24	♂
29	♂	Squamous cell		

TABLE 5—Carcinoma of the Lower Lip

Ten Proved Cases			Six Clinical Cases	
Age	Sex	Tumor Type	Age	Sex
19	♂	Squamous cell grade 2	24	♂
24	♂	Squamous cell	24	♂
24	♂	Squamous cell	24	♂
24	♂	Squamous cell grade 1	26	♂
24	♂	Squamous cell grade 2	29	♂
25	♂	Squamous cell	30	♂
26	♂	Squamous cell		
27	♂	Squamous cell grade 2		
27	♂	Squamous cell grade 3		
28	♂	Squamous cell		

About six months ago a bilateral inguinal gland dissection was done. The nodes were hyperplastic but no metastases were found.

Of the patients with proved carcinoma of the breast the youngest was 22 years of age (two patients). Three of the twenty-two patients were single and at least three others had never been pregnant. Four of the patients had had previous operations elsewhere, with recurrence. One patient had been "watched" by a physician for ten months. Four of the twenty-two patients were Negroes. Seven patients gave a history of duration, from first noticing symptoms to entering the clinic, of one month or less, six patients of from one to six months, four of from seven months to one year, three patients of from one to two years, while two were indefinite. Sixteen of the twenty-two patients had radical operation (of which eight had axillary node metastases at the time of operation). Three had roentgen therapy only, two went elsewhere for treatment. One was not treated (had previous operation). Of the twenty-two patients with proved carcinoma, nine are known to be living, five are dead, six are untraced.

(one followed for five months, two for one year) and two were operated on elsewhere. Of the nine known living patients, five have been operated on for less than two years, one has survived three years, one four years, one six years and one seven years. It is interesting to note that the patients who have gone six and seven years without recurrence both had axillary metastases at the time of operation and surely would have been dead long before this if a radical operation had not been done.

The duration of the disease in persons with carcinoma of the extremities varied from one year to four years, the average being about two years. One patient had no recurrence in more than two years, one none in more than four years, while three cannot be traced.

#### MISCELLANEOUS

*Proved Case*—A woman, aged 26, with adenocarcinoma of the left supraclavicular region (Virchow's

TABLE 6—Carcinoma of the Mouth

Four Proved Cases				
Site	Sex	Age	Tumor Type	
Tongue	♀	21	Squamous cell	
Tongue	♀	24	Squamous cell	grade 3
Throat	♂	21	Squamous cell	grade 4
Nasopharynx	♀	24	Squamous cell	grade 2
Two Clinical Cases				
Site	Age	Sex	Comment	
Upper jaw	28	♂	Operation elsewhere	
Palate	27	♂	Inoperable previous operation elsewhere	

TABLE 7—Carcinoma of the Gastro-Intestinal Tract

Seven Proved Cases				
Site	Age	Sex	Tumor Type	
Stomach	28	♂	Adenocarcinoma	grade 2
Ampulla of Vater	26	♂	Adenocarcinoma	grade 3
Colon	27	♀	Adenocarcinoma	
Rectum	25	♂	Adenocarcinoma	grade 4
Rectum	23	♀	Adenocarcinoma	grade 1
Rectum	20	♀	Adenocarcinoma	
Anus	30	♀	Squamous cell	grade 3
One Clinical Case				
Site	Age	Sex	Comment	
Rectum	30	♂	Had colostomy done elsewhere	

node), primary lesion unknown, of two months' duration, died within three months.

*Clinical Case*—A man, aged 30, had had an operation elsewhere for carcinoma of the penis of one year's duration. He was told that he had cancer but sections were not seen at this hospital. He died elsewhere, supposedly of cancer, within five months.

#### SKIN

There were twenty-six cases of carcinoma of the skin, confirmed microscopically, in patients 30 years of age or under. Twenty-two of these cases have already been listed under "face" or "extremities." Of the remaining four, one woman, aged 27, had a basal cell carcinoma of the skin of the back, and three patients had xeroderma pigmentosum with carcinomatous changes, one being an 8½ year old girl who had a grade 1 squamous cell carcinoma, the other two were boys, aged 9 and 18 years, both with squamous cell carcinoma.

The three patients with carcinoma of the ovary had never been pregnant. The 15 and 17 year old girls

were unmarried. The 17 year old girl was a Negress. The duration of symptoms in these cases (ovary) was six weeks, five months and nine months. The duration of the vaginal cases was indefinite. One of the patients with carcinoma of the vagina was not treated.

TABLE 8—Carcinoma of the Breast

Twenty Two Proved Cases				
Patients	Age Years	Sex	Tumor Type	
4	22-25	All females	Adenocarcinoma	
			Not graded	14
18	26-30	All females	Grade 3	6
			Grade 4	2
One patient with adenocarcinoma grade 3 was carcinoma en cuirasse				
Nine Clinical Cases				
3	22-24	All had 'lumps removed which recurred (1 twice)		
6	25-30	Two had lumps removed which had recurred		

TABLE 9—Carcinoma of the Extremities (Five Proved Cases)

Site	Age	Sex	Tumor Type	
Arm	19	♀	Adenocarcinoma	
Arm	80	♀	Melanocarcinoma	
Thigh	20	♀	Squamous cell	
Thumb	24	♂	Squamous cell grade 2	
Elbow (skin)	28	♀	Cystic basal cell	

here (biopsy only), the other two died within six and seven months. The patients with carcinoma of the ovary died within two, six and fourteen months.

The youngest patient was 20 years of age. Four patients gave a history of duration of one month or

TABLE 10—Carcinoma of the Female Genital Tract Other Than Cervix

Six Proved Cases			
Site	Age	Tumor Type	
Vaginal wall	26	Squamous cell	
Vagina	27	Squamous cell	
Vulva	26	Squamous cell	
Ovary	15	Colloid carcinoma	
Ovary	17	Adenocarcinoma grade 3	
Ovary	26	Cystic adenoma      carcinomatous changes	
One Clinical Case			
Site	Age	Comment	
Ovary	20	Patient had several previous operations treated here with roentgen rays lived almost 5 years	

TABLE 11—Carcinoma of the Cervix Uteri

Fifty Seven Proved Cases				
Patients	Age	Tumor Type		
14	20-25	Squamous cell grade 1		1
		Squamous cell grade 2		13
43	26-30	Squamous cell grade 3		10
		Squamous cell grade 4		4
		Adenocarcinoma grade 1		1
		Adenocarcinoma grade 2		1
		not graded (squamous cell)		18
Twenty Six Clinical Cases				
13 patients were dead within 14 months				
13 not treated or untraced				

less, thirty-four patients of six months or less, sixteen patients of from six to twelve months. The average duration for the group was slightly less than six months. Two patients were not treated at the clinic (biopsy only), three have not been traced, twenty-one were alive when last seen, or heard from, while thirty-

one are dead. Of the living patients eleven were alive at one year, four at from one to two years, one at from two to three years, three at four years, one at from four to five years and one over five years.

## COMMENT

The youngest patient with carcinoma in our series was 8½ years old (xeroderma pigmentosum, with carcinomatous changes). The youngest patient with carcinoma of the lip was 19 years of age, of the breast 22 years (two patients), of the ovary 15 years, of the cervix 20 years, and of multiple basal cell carcinoma 22 years.

For the past five years, in this clinic, excluding the female genital tract and breast, 17 per cent of the cancer cases with microscopic diagnosis occurred in persons 30 years of age or younger. For the same time 74 per cent of the patients with proved carcinoma of the cervix were in the first three decades of life. Four and three-tenths per cent of the breast cancers occurred in the same age period.

Carcinoma of the cervix and breast in persons 30 years of age or younger has increased in a greater ratio at this clinic for the past five years as compared to the previous five years than the same condition in older women.

Carcinoma of the cervix, mouth and breast (to a lesser degree) is more malignant, with a poorer prognosis, in young persons than the same condition in older patients.

The grading of the microscopic sections, the symptoms and duration are about the same in persons of 30 years or younger as in older persons.

Sarcoma is generally considered to be more frequent in young persons than in older ones. However, at this clinic, regarding the actual number of cases, carcinoma is more frequent in the first three decades of life than sarcoma.

## CONCLUSIONS

One hundred and thirty-four cases of carcinoma occurring in persons of 30 years of age or younger were confirmed by microscopic examination.

The main purpose of this paper is to reemphasize the all important fact that carcinoma can and does occur in persons 30 years and younger in practically all anatomic locations. The age of the patient must not influence one in procrastination and "watchful waiting." The results of treatment in young persons, as in older ones, depend on early diagnosis and adequate treatment.

723-726 Metropolitan Building

**Obsolete Spare Parts**—Man is a made-over animal. In the course of evolution, his ancestors have functioned as arboreal pronogrades and brachiators or arm progressing tree dwellers—not to mention more remote stages involving other changes of habitat, posture and mode of locomotion. This protean history has necessitated repeated patching and reconstruction of a more or less pliable and long suffering organism. The bony framework has been warped and cramped and stretched in one part or another, in accordance with variations in the stresses and strains put upon it by different postures and by changes in body bulk. Joints devised for mobility have been readapted for stability. Muscles have had violence done to their origins and insertions and have suffered enormous inequalities in the distribution of labor. Viscera have been pushed about hither and yon, hitched up, let down, reversed and inverted. In making a new machine out of an old one, plenty of obsolete spare parts have been left to rattle around inside.—Hooton, C. A. *Apes, Men and Morons*, New York, G. P. Putnam's Sons, 1937, page 243.

## THE TREATMENT OF SCHIZOPHRENIA WITH METRAZOL BY THE PRODUCTION OF CONVULSIONS

ISIDORE FINKELMAN, M.D.  
CHICAGO

D. LOUIS STEINBERG, M.D.  
AND

ERICH LIEBERT, M.D.  
FIGIN, ILL.

Putting into practice his hypothesis that schizophrenia and epilepsy are biologically antagonistic entities, Meduna<sup>1</sup> attempted to bring about a remission of schizophrenia by the production of epileptiform seizures. He began his experiments by using camphor in oil but later used pentamethylenetetrazol (metrazol) because of its greater reliability as a convulsant drug. He treated with this method 110 schizophrenic patients, of whom fifty-four had a remission. This is a percentage of about 50 per cent, which exceeds the percentage reported for spontaneous remissions from almost all clinics. Moreover, when the remissions are classified according to duration of the disease, the percentage rises to 90 per cent, for patients who were ill less than one year. Regardless of the validity of Meduna's theory that epilepsy and schizophrenia are biologically antagonistic disease entities, the high percentage of therapeutic results which he reported merited further investigation. His results have been corroborated by Wahlmann,<sup>2</sup> von Angyal and Gyarfás,<sup>3</sup> Friedman<sup>4</sup> and others. Gullotta<sup>5</sup> was unable to confirm them, but he produced only eight convulsive seizures in each of his ten schizophrenic patients.

We began the use of metrazol in the treatment of dementia praecox<sup>6</sup> at the Elgin State Hospital March 1, 1937.

### USE OF METRAZOL AS A CONVULSANT

The patient is given a thorough physical examination to rule out infectious process, pulmonary disease or cardiovascular disorders, which are contraindications.

The treatment is given in the morning when the patient's stomach is empty. The dose is the smallest amount of the drug that will produce a typical convulsive seizure. There is no relationship between body weight and the amount of drug necessary to produce a convulsive reaction. Our first dose ranged from 2 to 5 cc of a 10 per cent solution. As a rule we administered 1 cc for about each 30 pounds (13.6 Kg.) of body weight but not over 5 cc for the first dose. This dose usually produced a convulsion. When the convulsive dose was reached, it was maintained until we failed to get a reaction. In such cases the treatment was repeated the next day, the dose being increased by 1 cc. For patients with a longer duration of the

Read before the Chicago Neurological Society Oct. 21, 1937.  
Dr. C. F. Read gave helpful suggestions during the course of the work.  
From the Elgin State Hospital and the Department of Nervous and Mental Diseases, Northwestern University Medical School.  
1. Meduna, L. New Methods of Medical Treatment of Schizophrenia. *Arch. Neurol. & Psychiat.* 35:361 (Feb.) 1936. Die Konvulsionstherapie der Schizophrenie. *Psychiatr. neurol. Wchnschr.* 37:113 (July 6) 1935. Versuche über die biologische Beeinflussung des Ablaufs der Schizophrenie. Camphor und Cardiazolkrampe. *Ztschr. f. d. Neurol. u. Psychiat.* 152:235-262, 1935.  
2. Wahlmann. Vorläufige Mitteilung über Konvulsionskur, Psychosen, *Psychiatr. neurol. Wchnschr.* 38:78-79 (Feb. 15) 1937.  
3. von Angyal, I. and Gyarfás, K. Ueber die Cardiazolkrämpfe bei der Schizophrenie. *Arch. f. Psychiat.* 106:1-1936.  
4. Friedman, F. Personal communication to the authors.  
5. Gullotta, S. La cura della schizofrenia con la provocazione di convulsioni epilettiche. *Riv. sper. di freniat.* 60:510 (Dec. 31) 1937.  
6. We had had no experience with metrazol in the treatment of conditions such as postanesthetic collapse or barbiturate poisoning.

psychosis the dose of the drug had to be increased more often than for others. The treatment was administered two or three times a week.

When the dose is insufficient to produce a complete convulsion, a minimal reaction consisting of mental confusion and a few myoclonic movements occurs. With a still smaller dose there is no reaction except pallor, cough and an anxious facial expression.

The treatment is continued until the patient shows a remission. The patient is observed from two weeks to a month before parole is recommended. If during this observation period he relapses, the treatment is resumed until improvement is again noted. Two patients relapsed after being home for two months. One had had ten convulsions. He was returned to the hospital and treatment reinstituted, and after thirteen more convulsions he again appeared in good remission and was returned to his home. The other patient has shown no further response to treatment.

As a rule from twenty-five to thirty injections are given. However, if a patient shows some signs of

and the back arched. The eyeballs may move upward or to either side or remain in the original plane. The arms and legs are tetanically contracted in extension. The wrists and fingers are flexed, the position of the thumb frequently being between the index and the middle finger. Sometimes before the opisthotonos there is a flexion of the thighs, legs and feet, with the large toes in the Babinski position. This is followed by an extension of the lower extremities. Frequently there is an adductor spasm, with the legs in a scissor-like position. These positions of the body may change during the tonic phase, the knees may be flexed on one side and extended on the other. There may be a rotation of the pelvis to one or the other side, with flexion of the thighs and legs, followed by an extension. Similarly, the upper extremities may assume various postures.

The tonic phase lasts from five to thirty seconds and is followed by another clonic phase. The first clonic movements break through in the fingers and spread to involve the entire body. Such rhythmic clonic move-

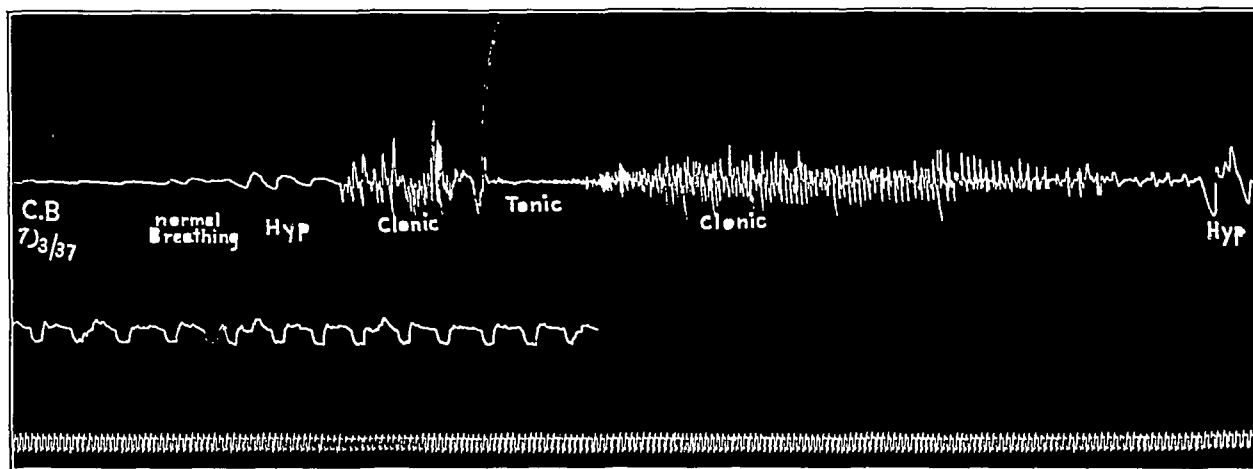


Fig 1—Motor pattern of the metrazol convulsion showing the clonic tonic clonic sequence

improvement the injections are continued until there is no further evidence of improvement.

Injury to the tongue is prevented by placing a soft rubber wedge between the teeth during the tonic phase when the mouth is open. There were no fatalities in our cases. However, minor complications are at times encountered, such as dislocation of the mandible and dislocation of the head of the humerus. These dislocations were reduced and their recurrence prevented by supporting the parts involved.

#### PATTERN OF THE CONVULSIONS

With the aid of cinematographic and kymographic tracings (fig 1) we observed the following series of events in the motor pattern of the convulsion produced by metrazol.

From two to five seconds after the intravenous administration of metrazol the patient coughs, and five seconds later marked pallor of the face occurs. From three to ten seconds after the injection an intense blepharospasm occurs and the facial expression is a mixture of bewilderment and fear. Five seconds later myoclonic convulsive movements begin in the face, shoulders and arms, sometimes only on one side. A well marked rhythmic clonic phase develops, as shown clearly by the tracings (fig 1). After about fifteen seconds a tonic phase ensues. The head is retracted

and the back arched. The eyeballs may move upward or to either side or remain in the original plane. The arms and legs are tetanically contracted in extension. The wrists and fingers are flexed, the position of the thumb frequently being between the index and the middle finger. Sometimes before the opisthotonos there is a flexion of the thighs, legs and feet, with the large toes in the Babinski position. This is followed by an extension of the lower extremities. Frequently there is an adductor spasm, with the legs in a scissor-like position. These positions of the body may change during the tonic phase, the knees may be flexed on one side and extended on the other. There may be a rotation of the pelvis to one or the other side, with flexion of the thighs and legs, followed by an extension. Similarly, the upper extremities may assume various postures.

The tonic phase lasts from five to thirty seconds and is followed by another clonic phase. The first clonic movements break through in the fingers and spread to involve the entire body. Such rhythmic clonic move-

ments are seen while the extremities are still held in tonic extension. The clonic movements are at first rapid, gradually become less frequent with increasing amplitude and cease after about twenty-five seconds. During this stage ejaculation may occur. Urination is observed after relaxation. During the tonic phase and the succeeding clonic one, there is a period of apnea, with marked cyanosis. After a few seconds the patient resumes breathing. A pilomotor reaction is present during the tonic phase and gradually disappears during the apneic period. Sometimes the lower extremities and not infrequently the upper extremities are rigidly extended after the second clonic phase. After the convulsion the patient frequently is drowsy and may fall asleep. About one minute after the last clonic phase a period of restlessness may occur. The patient may thrash his arms about, or there may be a definite pattern of movements, such as rolling of the body to the side. About five minutes after the injection the patient's attention may be attracted by verbal stimuli. As a rule each individual has his own constant motor pattern. The patient may show some motor restlessness immediately before the first clonic phase, such as flapping his arms as in "wing beating," brushing his face or alternately raising or lowering his legs.

in a few seconds by increased deep reflexes, sustained ankle clonus and the Babinski sign. Usually there is a short period of confusion after the seizure. In some patients the confusion may last several hours. The patient has total amnesia for the phenomena, recalling only the injection and a feeling of anxiety. One patient counted to thirty after the injection but after the reaction stated that he recalled counting only to twelve.

REMISSION	□	○		▽	+	+	+						
	+	+			+	+	+						
REMISSION WITH SLIGHT DEFECT	○				+	+	+			+			
MARKED IMPROVEMENT STILL IN INSTITUTION		○			+	○	○	▽	▽		▽		
SLIGHT IMPROVEMENT				+	+	+	+	+	+	+	+	+	
UNCHANGED					○	○	○	+	+	+	+	+	+
					+	+	+	+	+	+	+	+	+
2 Mo. 4 Mo. 6 Mo. 12 Mo. 18 Mo. 2 Yrs. 3 Yrs. 4 Yrs. 5 Yrs. 10 Yrs. 17 Yrs.													
+ = CATATONIC    ○ = PARANOID    ▽ = MEDEPHRENIC    □ = UNDETERMINED													

Fig 2—Results of treatment in relation to the duration of the psychosis

The pupils are dilated during the convulsion and do not react to light. In some cases there is profuse perspiration after the convulsion. The blood pressure rises from 20 to 60 mm of mercury during the seizure and drops to its normal level in from ten to thirty minutes.

We have described the motor pattern of the convulsion produced by metrazol in some detail because it differs from that produced by other convulsant drugs. The metrazol convulsive pattern follows a clonic-tonic-clonic sequence and indicates a complete and intensive reaction of the central nervous system. Pollock<sup>7</sup> and his co-workers have observed in animal experiments with various convulsant drugs that this clonic-tonic-clonic sequence occurs most consistently after the injection of metrazol. Camphor monobromide, thujone, picrotoxin and insulin produce only clonic convulsions or, occasionally, tonic-clonic convulsions. At times a clonic-tonic-clonic sequence is observed with drugs other than metrazol, but only if lethal or almost lethal doses are employed.

ANALYSIS OF SIXTY-SIX CASES

We classified the therapeutic results in five groups: (1) complete remission, (2) remission with defect, (3) marked improvement, (4) slight improvement and (5) no change.

A patient is considered to be in a complete remission if he has returned to his prepsychotic level as determined by the history and if he has resumed his previous employment, shows no defect in ideation and behavior and has insight. If he lacks insight or shows other psychic symptoms but is able to adjust at home and resume his work, the result is classified as remission with defect. The patient with marked improvement remains in the institution and, although on a much higher level than he was prior to treatment, still requires supervision. Slight improvement indicates that some symptoms have disappeared but that the patient still has a preponderance of psychotic symptoms. One of the first objective signs of improvement in most patients is the change in affect or mood. The patient

7 Pollock L. J. Finkelman Isidore Sherman I. C. and Steinberg D. L. The Motor Pattern of Convulsions Produced by Various Drugs read before the Central Neuropsychiatric Association Oct. 9 1937

appears to relax and is more agreeable and sociable toward other patients and the hospital personnel, spontaneously helping with the hall work and even requesting to be industrially employed about the institution. Soon he becomes more interested in the environment and asks for his people, often spontaneously writing to them. It is obvious that psychotherapy has an important part in his progress at this point.

Among the sixty-six patients in our group, all types of dementia praecox except the simple were represented. The duration of the psychosis ranged from two months to seventeen years, in the majority of cases being over two years. In table 1 is given an analysis of the effect of treatment with relation to the duration of the psychosis. For example, in five of the seven cases in which the duration of the disease was six months or less there was a complete remission and in one a remission with a slight defect. One patient is markedly improved.

No patient who had had the disease more than two years had a complete remission. However, a remission with a slight defect could be obtained. The percentage of remissions drops very rapidly, so that after a duration of three years no remission is to be anticipated.

Table 2 is an analysis of the effect of therapy in relation to the various types of dementia praecox. Our results as given in this table indicate that the best results are obtained in treating the early types of catatonic and paranoid dementia praecox.

Figure 2 indicates clearly the absence of complete remissions when the patient had been ill over two years and the fact that no patient who had been ill under one year failed to show some response to treatment.

The question arises as to whether there is a relation ship between the number of treatments and the duration of the psychosis. By observing patients with a remission we have seen that the number of injections necessary to produce a remission increases with the duration of the psychosis (fig 3). For patients ill eighteen months or under, the average number of injections

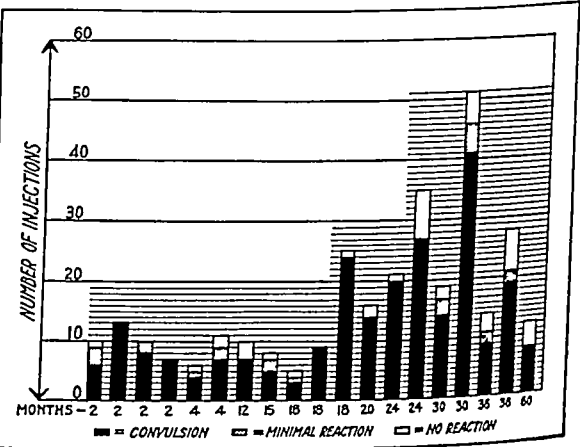


Fig 3—The number of treatments preceding a remission related to the duration of the psychosis

was ten and three-tenths and for those ill over eighteen months twenty-five and seven-tenths.

Many patients gain weight during treatment. We have not observed any critical changes in the cellular constituents of the blood, nor were there any noteworthy changes in the cholesterol, sugar, calcium and acid-soluble phosphorus contents of the blood before, during and at varying intervals after the seizure.



SUMMARY AND CONCLUSIONS

The convulsive treatment with metrazol is of value in the treatment of patients with dementia praecox, particularly when the duration is not more than two years. The procedure does not require extensive arrangements and can be carried out in any hospital. Results may be expected fairly early.

The convulsive seizure produces many changes in the organism, such as anoxemia followed by increased oxygenation, an increase in the supply of blood to the brain and an increase in the activity of the muscles with all the chemical changes accompanying such activity. All or some of these factors may be responsible for the remission produced in the schizophrenia. The problem still remains, however, of how physical changes in the body cause psychic symptoms to appear and disappear.

We treated sixty-six patients with dementia praecox by the administration of metrazol. The results were

TABLE 1—The Effect of Treatment with Relation to the Duration of the Disease

Duration Months	Number of Patients	Remission	Remission with Slight Defect	Marked Improvement Patient Still in Institution	Slight Improvement	Percentage at Home
1-6	7	5	1	1	0	85.0
7-12	3	1	0	0	2	33.0
13-18	7	3	1	1	1	57.0
19-24	8	2	1	1	1	37.5
25-36	15	0	4	3	4	26.6
37-48	5	0	0	2	1	0
49-60	10	0	1	0	4	0
60 and over	11	0	0	1	0	0

TABLE 2—The Percentage of Patients at Home and Improved as Related to the Diagnosis and the Duration

	Number of Patients	Duration Months	Improved	At Home
Catatonic	12	1-24	83%	58%
	9	25-204	66%	33%
Paranoid	9	1-24	66%	44%
	12	25-204	41%	17%
Hebephrenic	2	1-24	100%	100%
	20	25-204	45%	0
Undetermined	2	1-24	50%	50%
		25-204		

analyzed according to the duration and the type of dementia praecox. We found that 85 per cent of the patients whose symptoms were less than six months in duration had a remission. The rate of remission is almost inversely proportional to the duration of the psychosis. If the psychosis has lasted more than three years the anticipation of a remission is slight. Patients who showed a remission although their psychosis was over eighteen months in duration required larger doses of the convulsant drug and a greater number of convulsions. The type of dementia praecox that shows the greatest tendency to remit with this therapy is the catatonic, followed closely by the paranoid. Contraindications to this therapy are acute infectious diseases, pulmonary disease and cardiovascular disorders. We had no fatalities, and the only complications encountered were dislocation of the mandible and dislocation of the humerus.

303 East Chicago Avenue

INFLAMMATORY STRICTURES OF THE RECTUM ASSOCIATED WITH VENEREAL LYMPHOGRANULOMA

CARLETON MATHEWSON JR, M.D.  
SAN FRANCISCO

Although the clinical picture associated with that form of venereal lymphogranuloma occurring mainly in males and resulting in inguinal adenitis has been known since 1913,<sup>1</sup> it was not until 1927 that Frei<sup>2</sup> suggested that certain types of benign rectal stricture of unknown cause, together with many strictures thought to be due to tuberculosis, gonorrhea and syphilis, might be manifestations of this same disease. Frei and Koppel<sup>3</sup> then substantiated this assumption by demonstrating a positive cutaneous reaction to intradermal injections of diluted pus known to contain the virus of venereal lymphogranuloma in a number of their cases of inflammatory stricture of the rectum. Since that time a number of other reports have appeared in the literature confirming their results.

ETIOLOGY

Certainly all benign strictures of the rectum cannot be attributed to venereal lymphogranuloma, however, many of the etiologic theories suggested in the past are entirely unconvincing. A comprehensive review of the literature leaves little doubt that most of the early investigators regarded inflammatory strictures of the rectum as a late manifestation of syphilis, although it was noted that the lesions did not respond to the ordinary antisyphilitic treatment. Many of the later investigators turned to tuberculosis, amebic dysentery, gonorrhea and chancroid as the etiologic factors concerned. It is logical that syphilis should have been considered by most observers as the outstanding etiologic basis of rectal stricture. A large percentage of patients suffering with the malady have syphilis. The reason for this is obvious in view of the venereal nature of venereal lymphogranuloma. The Wassermann reaction has been used as a proof of syphilis as a causative agent. One author, Kallet,<sup>4</sup> reported a positive Wassermann reaction in as many as 38 per cent of a large series of patients with rectal stricture. On the other hand, no strictures were encountered by Schede<sup>5</sup> in 17,810 men treated for syphilis and only sixteen in 18,780 syphilitic women, this makes the syphilitic origin quite improbable. It is also true that the histologic changes often attributed to syphilis are considered by more recent authors to be nonspecific inflammatory reactions. The histologic changes which have been claimed as "typically syphilitic" are, as mentioned by Stannus,<sup>6</sup> the same changes which the tuberculosis enthusiasts recognize as essentially "tuberculous." Considering the enormous number of people suffering from tuberculosis who never show signs or

From the Stanford University Surgical Service, San Francisco Hospital, Unit of the San Francisco Department of Public Health.  
The Surgical Service of the University of California at the San Francisco Hospital permitted examination and study of many of their patients.  
1. Durand M, Nicolas J and Favre M. Société de chirurgie de Lyon meeting of Feb 20 1913. Lyon med 121 64 1913. Lyon chir 9 561 1913.  
2. Frei Wilhelm. Der gegenwartige Stand der Kenntnisse von der Elephantiasis genito-anorectalis (Esthionene entzündliche Rektum stricture). Deutsche med. Wchnschr 58 1964 (Dec. 9) 1932.  
3. Frei Wilhelm and Koppel Alice. Ulcus Vulvae Esthionene Klin Wchnschr 7 2331 (Dec. 2) 1928.  
4. Kallet H J. Proctitis Obliterans. J Michigan M Soc. 2:432 1921.  
5. Schede Max. Ueber die Resection des Mastdarmes bei den Stric turirenden Geschwuren des elben. Arch f klin Chir 1 835 1895.  
6. Stannus Hugh S. A Sixth Venereal Disease. Baltimore: William Wood & Co. 1933.

symptoms of rectal stricture, it would seem improbable that tuberculosis is a frequent cause of stricture.

Finkelstein<sup>7</sup> has observed not a single case of true inflammatory stricture of the rectum in an enormous number of cases of amebic dysentery. The occurrence of *Endamoeba histolytica* in cases of rectal stricture of various types probably is no higher than its incidence in association with many other diseases. The infrequency of development of stricture after gonorrheal proctitis speaks against this disease as an etiologic factor. Many unconvincing reports appear in the literature. It would seem from our present knowledge of the pathogenesis of venereal lymphogranuloma in many cases of rectal stricture that, even in the presence of gonococci, there probably was a coincident infection with the virus of venereal lymphogranuloma. Stannus<sup>6</sup> stated

Because the patient has had gonorrhea, chancroid or syphilis, or all of these diseases, there is no *prima facie* case for supposing they are etiological factors. Gummatous or tuberculous ulceration of the rectum may produce stricture of the rectum, but they do not produce "inflammatory stricture of the rectum." When these diseases and gonorrhea, etc., have been put forward as causes, the essential points in the nature of the condition appear to have been lost sight of. The pathogenesis of this type of stricture cannot be explained on such a basis.

The frequent finding of a positive Frei test in patients suffering with inflammatory stricture of the rectum is strong evidence that this disease is the real etiologic factor in the majority of cases.

#### CLINICAL PICTURE

The clinical picture of the disease in the rectum, at least in the advanced stages, is unmistakable. There is a progressive history of bloody mucous discharge from the rectum, pruritus and tenesmus, with intermittent periods of marked constipation and in many cases acute obstruction. In most series the disease is reported to occur far more commonly in women than in men and in this country most frequently in Negroes. This has not been the experience of my co-workers and me at the San Francisco Hospital. In our series of seventy-eight patients, sixty were men and eighteen were women, and of these only twelve were Negroes. The stricture itself usually is one of three fairly distinct types, though occasionally combinations of these occur. The first type consists of an annular diaphragm of fibrous consistency occurring most commonly from 1 to 6 cm above the anocutaneous margin. A small aperture usually remains in the central portion of the diaphragm, through which the mucous membrane above may herniate as small polypoid projections resembling a cockscomb. On palpation the margins of the stricture are found to be granular and, if the palpating finger can be introduced through the aperture, the mucous membrane above is found to be of normal consistency. It is my opinion that this is an abortive, nonprogressive type of the disease in the rectum which, after advancement to this stage, remains stationary, however, the mucous membrane just distal to the stricture is subject to trauma, ulceration and secondary infection, which, in most cases, leads to the formation of perirectal abscesses and fistulas. These annular diaphragm-like strictures are usually singular but may be multiple, occurring at different levels almost exclusively in the lower 6 cm of the bowel.

The second type of stricture is usually from 2 to 6 cm in length, funnel shaped and of india rubber consistency and feels granular on palpation. The smallest aperture of the funnel is at the proximal end of the stricture, where the infiltration stops abruptly. The mucous membrane above this site is normal, whereas that covering the lesion is characteristically hyperplastic and may have a glistening appearance. The mucous membrane below the stricture and the skin about the anus are commonly the seat of ulceration and polyposis.

Occasionally there is a third type of stricture, which may be very extensive, at times involving the entire bowel below the rectosigmoid junction. In one of our patients the process extended from the anus through the lower part of the bowel and into the distal opening of a barrel-shaped colostomy at the sigmoid flexure. Along the course of these lesions there may be levels at which the constriction is much more advanced than at others. It is possible that this type originates as isolated lesions at different levels in the bowel which gradually coalesce into one long tubular stricture.

Papillomas of the mucous membrane below the site of stricture are almost invariably present in all three types, and the skin about the anus is hyperplastic and often the site of condylomatous growths. The fistulas, if present, are usually multiple and open into the rectum just below the stricture. The stricture of the rectum may be found alone or associated with the other manifestations of the disease, constituting the genito-anorectal syndrome. In the advanced stages in women there may be more or less complete destruction of the rectovaginal septum, with the formation of recto-vaginal fistulas. We have observed a patient in whom the destruction and infiltration by scar tissue of the perineum was so extensive that it was necessary that her child be born by cesarean section. These manifestations of venereal lymphogranuloma are not considered in this paper.

Although the clinical picture of the advanced stages has been described frequently, to our knowledge the early stages of the rectal lesion are seldom recognized as such. The patient in whom the disease occurs usually is not the type who seeks early medical advice. If he does, the early manifestations of venereal lymphogranuloma in the rectum are apt to go unrecognized or to be attributed to some other disease. In practically every series of cases reported in the literature as in our own, a large percentage of the patients had been treated over a period of years without correct diagnosis. It is striking how many of these patients had been operated on for hemorrhoids, polyps, fissures or fistulas without improvement and with eventual formation of stricture. In many cases the formation of stricture had been falsely attributed to trauma resulting from operation. There is little doubt that a large percentage of the so-called postoperative traumatic strictures of the rectum would actually have formed without operation and that the operations performed were carried out without the surgeon's having recognized the true underlying pathologic process.

The early clinical manifestations are often indistinguishable from those of any other irritative lesion in the lowermost segment of the bowel. The earliest symptom is usually burning or pruritus of the skin about the anus, associated with more or less mucous discharge. The discharge may be so minimal that its presence is completely ignored by the patient. Examination at this time may reveal no more than

<sup>7</sup> Finkelstein, B. K. Operative Behandlung entzündlicher Verengerungen des Mastdarmes. Arch. f. klin. Chir. 168: 547, 1932.

localized swelling of the mucous membrane of the anal canal or diffuse edema of the mucous membrane throughout the entire lower segment of the bowel. Digital examination may give entirely negative results. Examination with a short proctoscope often results in pouting of the mucous membrane into the orifice, which may well be falsely interpreted as an extrusion of internal hemorrhoids. The edema and swelling of the mucous membrane, whether localized or diffuse, usually persists for several weeks, after which time it gradually becomes hyperemic and bleeds easily when traumatized. Minute papillomatous outgrowths appear over the edematous part. Digital examination at this stage reveals the presence of single or multiple enlarged, indolent, somewhat movable glandular swellings lying immediately under the bowel wall. With a sigmoidoscope it is often possible to recognize these swellings, covered with intact mucous membrane, protruding into the lumen of the bowel. The edema of the mucous membrane, along with the swelling of the lymph glands, may disappear entirely, so that subsequent examination reveals a perfectly normal bowel. This is probably an abortive type of the disease which never advances past this stage and recedes spontaneously. In other cases the perirectal tissues in the vicinity of the glandular swellings gradually become infiltrated, so that on digital examination one finds localized areas of perirectal and then submucosal induration, which gradually spread until they have completely infiltrated the wall and encircled the lumen of the bowel.

The infiltration may take place in one localized segment, or it may appear concurrently at several different levels. These areas then spread longitudinally until they coalesce and become a single cylinder several centimeters in length enveloping the entire circumference of the bowel. We have never observed a patient long enough to see the advance of the disease in the rectum from its earliest manifestations to the late picture. However, we have seen localized edema of the mucous membranes, with underlying glandular swelling, advance to the stage of a limited cylindric fibrous stricture like a signet ring, with subsequent ulceration and formation of fistula. In our experience the discharge from the rectum remains mucoid until ulceration of the mucous membrane occurs, at which time it changes to a bloody mucopurulent discharge, seen in the late stages. It is difficult to explain the ulceration of the mucous membrane because, as a rule, it does not occur at the site of the stricture but rather in the mucous membrane immediately below. We have never actually observed ulceration of the mucous membrane resulting from suppuration of an underlying lymph gland, although, reasoning from the pathologic process which we know occurs in the inguinal lymph glands (in this particular manifestation of venereal lymphogranuloma), it would be reasonable to assume that the perirectal glands undergo the same changes and actually break down to form fistulas emptying into the rectum or into the perirectal tissues. One might seek proof of this contention in the fact that Frei antigen has been prepared successfully from pus obtained from sterile abscesses found in the region of the anus. The virus of venereal lymphogranuloma has also been demonstrated in the tissues about the rectum by intracerebral inoculation into monkeys. The persistent fistulas, however, are practically always secondarily infected and, in our experience, communicate almost invariably with the rectum or the anal canal at a site distal to the rectal stricture.

## LYMPHATICS

In order to understand the role of venereal lymphogranuloma in the pathogenesis of rectal stricture it is necessary to review the circulation of lymph in the genital, anal and rectal regions in men and women. Briefly it may be summarized as follows. The superficial as well as the deep lymphatics of the glans penis and the prepuce drain primarily into the inguinal lymph nodes. These in turn drain into the iliac nodes. Many anastomoses exist between the lymphatics of the scrotum, the glans penis and the skin about the rectum. Occasional anastomoses exist between the lymph vessels of the anterior urethral mucous membrane and the scrotal and anal regions. The lymphatics of the scrotal skin empty primarily into the inguinal nodes but also join the main lymph channels leading from the testicles into the aortic nodes. An indirect anastomosis between the penis and the anorectal lymph nodes is established through the abundant lymphatic connections of the anal and the scrotal skin. The anorectal nodes have direct connections with the superior hemorrhoidal and sacral nodes through lymph channels situated in the posterior wall of the rectum. Although the drainage of the anterior part of the urethra is for the most part into the inguinal nodes, that of the posterior part is into the posterior lymphatic pedicles of the prostate gland, which empty into the rectal stalks and thence into the rectal absorbent pedicles.<sup>8</sup> This direct communication between the posterior part of the urethra and the perirectal glands is of great importance, as it is through these channels that infections of the posterior part of the urethra find a way into the lymphatics about the rectum.

In women the lymphatics of the urethra and the vulva drain principally into the inguinal nodes. Direct trunks lead from there to the iliac and the hypogastric nodes. The lymph vessels of the posterior portion of the vulva have direct connections with those about the anus which, as in men, drain primarily into the inguinal nodes. There are, however, direct channels leading from the lymphatics about the anus into Gerota's nodes at the anorectal junction. There are also connections leading from the anal skin through lymph vessels in the posterior wall of the rectum into the sacral nodes. The lower third of the vagina has connections with the network of lymphatics about the anus as well as direct communications with the iliac and the hypogastric nodes. The middle as well as the upper portion of the vagina drains primarily into the iliac and the hypogastric nodes, although there are lymph vessels which penetrate the fascia of the rectum and anastomose with the lymphatics of the rectal wall. By this means there is established a direct communication between the vaginal wall and the anorectal glands of Gerota.<sup>9</sup>

It is generally believed that the sequelae of venereal lymphogranuloma, namely, elephantiasis of the genitalia, and anal and rectal strictures, do not occur as frequently in men as in women, the explanation being that the lymph vessels in men lead from the primary lesion on the glans penis or prepuce to the inguinal glands. In women the disease is not usually manifested by inguinal adenitis for the lymphatics drain from the primary lesion mostly to the deep pelvic glands, causing lymph stasis in the genital, anal and rectal regions. Our experience has shown that rectal involvement in men

<sup>8</sup> Vesselsrud J. I. Proc. Staff Meet. Mayo Clin. **11** 369 (June 10) 1936.  
<sup>9</sup> Barthels C. and Biberstein H. Beitr. z. Klin. Chir. **152** 161 (April) 325-464 (May) 1931.

is not at all infrequent and is dependent on the site of the primary lesion. Infections of the posterior part of the urethra with the virus, as well as primary lesions in or about the anus, in the male are usually followed by rectal involvement. On the other hand, primary lesions on the clitoris and the vulva in the female lead to inguinal involvement alone. In our experience the site of the primary lesion determines the nature of lymphatic involvement and the type of secondary lesion regardless of sex.

While the majority of investigators have come to the conclusion that the etiologic factor in the production of benign strictures is to be found in disturbances of lymph flow, the exact nature of this disturbance is not known. Chronic lymph stasis is thought by some to lead to disturbances in nutrition in the parts affected, which in turn may lead to ulceration, proliferation of connective tissue, elephantiasis and, finally, shrinkage and stricture.

The lymphatic channels about the rectum are subject to a great deal of variation, which in all probability accounts, in part at least, for the various types of lesions produced by their infiltration. Feilchenfeld<sup>10</sup> has suggested that in cases in which rectal stricture is unassociated with other features of the syndrome the initial lesion probably occurred about the anus. We are of the same opinion. In our experience it is rare to find rectal lesions in men associated with any of the other late manifestations of the disease. In a large percentage of our male patients we have been able to obtain a history of abnormal sexual practices. It is also rare to see a man in whom inguinal adenopathy has preceded rectal involvement. Inguinal adenopathy associated with rectal stricture is usually the result of secondary infection. We have one patient whose primary lesion was unquestionably on the penis, resulting in typical inguinal adenopathy and in subsequent rectal involvement. This patient, however, had so-called nonspecific urethritis immediately after the initial lesion on the penis. The rectal involvement was probably the result of posterior urethritis with extension through the lymphatics of the posterior part of the urethra and the prostate into those about the rectum. The rectal involvement in this patient is extensive. This is probably a more common mode of rectal involvement in men than is generally recognized. In many of our male patients the rectal involvement followed urethritis of unknown cause. Urethritis due to the virus of venereal lymphogranuloma has been reported frequently and may possibly accompany gonorrheal infections of the urethra.

We have one patient under treatment at present who, after nonspecific urethritis, had a periurethral abscess, perineal fistulas and, subsequently, a rectal stricture and rectal fistulas. This sequence of events supports our contention that infection of the posterior part of the urethra with the virus may well result in perirectal lymphatic involvement and eventually in rectal stricture. Lohe and Rosenfeld<sup>11</sup> said that there may possibly be not only an obstruction to the lymph flow but an accompanying retrograde flow of infectious material from the pelvic glands into the skin of the infected region and into the rectal wall, so that the resultant changes are, at least in part, specific ones due to the virus of venereal lymphogranuloma. Dick made the interesting observation that the inflammatory

processes seen in association with venereal lymphogranuloma do not subside after colostomy, as do the common infections seen after carcinoma of or injury to the bowel. This might be interpreted as some proof of the specific nature of the infection.

#### PATHOLOGY

It is important to remember that in the pathologic picture associated with rectal stricture the entire process takes place at a site where any sort of damage to the tissues will result in nonspecific infection. It would seem from our own experience that secondary infection of the tissues of the rectum plays an important part in the formation of stricture. It seems apparent that the early changes in the rectal wall are due to lymph stasis following infiltration of the regional lymphatics with the virus of venereal lymphogranuloma. The virus has been isolated from the perirectal tissues about these strictures, however, there is not sufficient proof at present that the strictures are entirely of this origin.

The histologic picture of the tissues involved in inflammatory stricture of the rectum has been described in cases in which the whole rectum was removed at operation. Although Barthels and Biberstein<sup>12</sup> expressed the opinion that the histologic changes in the rectum are pathognomonic of the disease, we have not been able to recognize them as such. These authors as quoted by Stannus,<sup>9</sup> described the pathologic picture in one of their cases as follows:

In case 2 the ampulla showed radiating scars, ulceration and some thickening of the wall, the mucous membrane of the rectum was slightly edematous and injected as far as the sigmoid. The lining epithelium in the lower part was flattened and metaplastic (leukoplakia) with cellular edema. Beneath this there was a diffuse small celled infiltration composed of lymphocytes, plasma cells, eosinophils, polynuclears and some epithelioid cells and newly formed capillaries. Deeper still was noted an irregularly disposed connective tissue made up of bands of fibers showing edema and hyaline change and the structureless remains of muscle fibers. The normal structure of the bowel wall had been lost. In the middle layers of the wall of the ampulla characteristic minute star shaped abscesses were found. These for the most part did not open towards the lumen of the bowel, but ran obliquely through the tissue. Their walls were composed of epithelioid cells and their contents consisted of lymphocytes, plasma cells, eosinophils with some polynuclears. Elsewhere small foci of infiltration up to the size of a millet seed were noted, composed of the same cell elements with tiny central areas of necrosis, forming what have been called miliary gummata. In some sections giant cells were numerous, in others none were discovered. Close to the necrotic foci, stained cell nuclear remains were in evidence. The normal tissue was entirely replaced by an abnormal granulation tissue. Some of the infiltrations were made up almost entirely of epithelioid cells or young connective tissue cells. These tiny granulomata had an appearance that suggested they were formed in minute lymph nodes. In the lymph glands of the adjacent perirectal fatty tissue in which the lymph sinuses were dilated similar cell elements were seen, forming little lymph thrombi lying in situ. Perivascular or, as has been pointed out elsewhere, what is more correctly described as paravascular infiltration was marked. It is an infiltration of the lymph spaces running in the sheaths of the vessels. In the perirectal fatty envelope close to the external wall of the rectum an obliterating arteritis was manifested. The media was unrecognizably fused with the other coats of the vessel. The veins showed changes in their walls resulting from infiltration from without. In a section of the wall of the rectum at 7 cm above the anus the changes were much the same. In sections taken at 20 cm above the anus the changes were most marked in the mucous membrane and less in the walls of

<sup>10</sup> Feilchenfeld H. Elephantiasis of Vulva, Anus and Rectum. *Med. Klin.* 28: 965 (July 8) 1932.

<sup>11</sup> Lohe H. and Rosenfeld H. Neue Ergebnisse über die Spätfolgen des Lymphogranuloma inguinale. *Med. Klin.* 28: 1486 (Oct. 21) 1932.

<sup>12</sup> Barthels C. and Biberstein H. Zur Histogenese der Lymphogranulomatosis inguinalis auftretenden Rektumstriktur. *klin. Chir.* 152: 464 (May) 1931.

the bowel. There was a marked proctitis with partial destruction of the epithelial lining but the subjacent layers preserved their structure and did not show the same results of chronic inflammation, though in the middle layers of the wall of the rectum small areas of infiltration were present similar to those seen in sections of the lower part of the wall of the rectum. In the ampulla, therefore, the changes in the mucous membrane are of minor degree, while there is marked infiltration and replacement of normal tissue in the submucous layers and perirectal connective tissue. Above the ampulla the changes are more marked in the mucous membrane and comparatively slight in the rest of the bowel wall.

In our opinion this pathologic picture may well represent nonspecific inflammatory changes which have taken place in tissues the resistance of which has been greatly lowered by the destruction of their lymphatic drainage. Although specific changes may take place after invasion of the tissues with the virus of venereal lymphogranuloma, we have been unable to recognize them histologically as such except in the lymphatics. As the late changes in the rectum are invariably associated with secondary infection clinically, it seems reasonable to assume that the histologic picture in the rectum may also be explained on this basis.

#### PATIENTS STUDIED

Eighty-nine patients have been treated for benign rectal stricture in the San Francisco Hospital since July 1, 1919. The histories of seventy-eight were complete enough so that a definite conclusion might be drawn as to the nature and localization of the disease. The remaining histories contained insufficient data and were discarded. Of the seventy-eight patients sixty were men and eighteen women. Twelve patients were Negroes, and nine of the remaining sixty-six white persons were Mexicans. Forty of these patients entered the hospital before the introduction of the Frei test, a diagnosis of syphilitic stricture was made in twenty-one cases (in nine apparently on the sole basis of a past history of syphilis), of gonorrheal proctitis in twelve, of tuberculosis in three and of traumatic stricture in four (in three of stricture following childbirth and in one of stricture following hemorrhoidectomy). A critical analysis of these histories in view of our present knowledge of the role of venereal lymphogranuloma in the pathogenesis of benign rectal stricture would bring all but four of these cases into the category of this disease.

The remaining thirty-eight patients were seen and studied by me, and in all of them a positive intradermal reaction to the virus of venereal lymphogranuloma was obtained. In eleven patients a localized annular stricture was found, in eighteen the characteristic funnel-shaped stricture and in five a far advanced tubular stricture involving the greater part of the bowel distal to the rectosigmoid junction. Four patients were seen in the early stages of the disease and presented the picture of acute proctitis with perirectal glandular enlargement.

We were able to obtain a definite history of abnormal sexual practices from over half of the patients studied. It is interesting to note that only two of the men studied had ever been married, although the ages of the patients ranged from 19 to 72 years. Negative clinical and serologic evidence of syphilis was obtained in enough cases to rule out this disease as an etiologic factor.

#### TREATMENT

The treatment of inflammatory stricture of the rectum is in general unsatisfactory. Many different types of treatment suggested in the past have, after due

trial, been discarded. The use of many of the drugs suggested in the literature for both local and systemic treatment has been followed by discouraging results in our hands. Roentgen rays and radium are of little or no value. The destructive nature of the disease is such that it leads to irreparable damage of the tissues so that, in the advanced stages, one can hope only to prevent extension, to relieve symptoms as they develop and to combat the ravages of secondary infection. In the early stages it is possible that the intracutaneous and intravenous use of Frei antigen in an attempt to desensitize the patient to the virus may be useful. We believe that in certain of our patients desensitization therapy has enabled us to prevent or at least check the advancement of the disease to the destructive lesions seen in the late stages. If the disease in the rectum is recognized early intensive desensitization over a long period is justified. At the same time it is necessary to realize that superimposed secondary infection must be prevented at all costs. Unnecessary surgical procedures about the rectum in the presence of lymph stasis due to the virus of venereal lymphogranuloma necessarily lead to the opening of channels to secondary infection which otherwise might be prevented. In all patients the lower part of the bowel should be kept as clean as possible. Avoidable constipation should be prevented, and measures should be instituted to keep the skin about the anus as clean as possible. When perirectal abscesses form they should be drained by wide incision, and every attempt should be made to find their communication with the lumen of the bowel, so that when fistulous tracts develop they may be excised in toto and their communication with the bowel widely incised. Radical surgical procedures in the presence of rectal stricture are not to be feared, for one can hope for nothing more than the eradication of the disease in the tissues by the formation of fibrous tissue.

It is well known that the inflammatory processes seen in association with venereal lymphogranuloma do not subside after colostomy, as do infections which follow carcinoma or injuries to the bowel. In our opinion one is rarely justified in performing a colostomy. The patient continues to have his rectal symptoms, as before, and in addition must live with an artificial anus. Although we have seen two patients in whom the inflammatory rectal stricture led to complete obstruction of the bowel, the condition was relieved by local dilation and recurrent obstruction was prevented by regulation of the diet and the administration of liquid petrolatum. Many patients received considerable relief by treating their lower bowel as they would an artificial anus, that is, by the use of an early morning enema and regulation of their bowel habits by diet. Patients with thin annular strictures may often be relieved of their obstructive symptoms by simple local excision of a portion of the stricture. Radical surgical excision of the rectum, as suggested in Germany by Schede,<sup>2</sup> seems to us unjustifiable. We have seen two patients so treated in whom the disease continued to advance after excision and secondary infection led to extensive abscess and fistula formation.

In our opinion repeated dilation of the strictures by mechanical means leads to unnecessary trauma and should be utilized only in cases in which complete obstruction is imminent. At present we would suggest that in every case an attempt be made to prevent the spread of infiltration with the virus by the use of intracutaneous and intravenous injections of Frei antigen,

that each patient be instructed how he may keep himself clean by the use of sitz baths, enemas and proper diet, and that secondary infection be controlled by intelligent surgical intervention

#### SUMMARY AND CONCLUSIONS

Eighty-nine patients with benign rectal stricture were seen at the San Francisco Hospital from 1919 to 1937. Seventy-eight patients were studied, in seventy-four the condition was considered to be the result of infection with the virus of venereal lymphogranuloma.

The disease occurred in sixty men and fourteen women, twelve were Negroes and nine were Mexicans.

Thirty-eight patients were tested with the intradermal injection of Frei antigen, and in every case a positive reaction was noted.

Early recognition of the disease is important.

Rectal involvement in men occurs mainly after infection with the virus of the posterior part of the urethra or as a result of primary lesions in the region of the rectum.

The intradermal and the intravenous use of Frei antigen is helpful when associated with proper surgical care of the secondary infection involved. The use of dilators and radical removal of the rectum are not advisable.

### MENTAL SYMPTOMS ASSOCIATED WITH BRAIN TUMOR

A STUDY OF 530 VERIFIED CASES

MOSES KESCHNER, M.D.

MORRIS B. BENDER, M.D.

AND

ISRAEL STRAUSS, M.D.

NEW YORK

Our purpose in this investigation was to ascertain the frequency of occurrence, the nature and the localizing value of mental symptoms in cases of tumor of the brain. In previous communications we described the mental symptoms in patients with tumor of the frontal lobe<sup>1</sup> and temporal lobe<sup>2</sup> and compared them with the mental symptoms of patients with tumor located below the tentorium<sup>3</sup>. In the present paper we are reporting in brief the psychic disturbances in patients with a tumor located in any part of the brain. The study was based on personal observations of 530 patients with expanding intracranial lesions in whom the diagnosis was confirmed by operation, necropsy or both. The location of the tumors and their histologic nature are recorded in table 1.

Abnormal mental reactions play an important role in the symptomatology of tumor of the brain. The reactions may occur at any time during the course of the disease. In many cases they are the earliest and in some the first symptoms of the ailment, preceding by weeks, months or even years the neurologic evidences of intracranial expanding lesion. Some patients with tumor of the brain have a genuine psychosis, for which they are admitted to a hospital for mental diseases. In such institutions the presence of a tumor may not be recognized until necropsy. On the other hand, in

patients with a definite psychosis of endogenous or exogenous etiology, a tumor of the brain may develop in the course of the psychosis as an independent condition. Although one would expect the mental picture of a tumor of the brain to assume the characteristics of the so-called organic reaction type, clinical experience shows that this is not always the case.

Unusual difficulties may be encountered in the evaluation of mental symptoms in a case of brain tumor in persons suffering from cerebral arteriosclerosis prior to the appearance of symptoms and signs of a focal lesion in the brain. In such cases one must be guided solely by the history of the patient's previous mental condition. Ordinarily it is impossible to make an exhaustive and satisfactory investigation of the patient's personality before the appearance of symptoms of brain tumor, especially with the patient in the state in which he usually is when he is hospitalized.

Another disturbing factor in the evaluation of mental symptoms in cases of brain tumor is the frequent occurrence of the convulsive state. In many patients the abnormal state due to the presence of an intracranial growth may be wrongly interpreted and attributed to idiopathic epilepsy.

The actual determination of the absence or presence of mental symptoms may be difficult in some cases of brain tumor owing to disturbances in the patient's speech. The presence of motor or sensory aphasia, apraxia or even dysarthria may so interfere with the patient's ability to communicate his thoughts to the examiner that the results obtained from the psychiatric examination are rendered difficult to interpret. The mental capacity and the emotional state of most of these patients could be determined only by observing their reactions in the wards and by their mode of adjustment to the hospital routine.

Our material was analyzed from the point of view of disturbances in the sensorium, affect (including euphoria and facetiousness), memory and orientation, intellect and higher psychic functions, hallucinations and sphincteric disturbances. Transitory abnormal mental reactions associated with convulsive seizures, epileptic equivalents (except uncinate phenomena) and those following intracranial injections of air or operations were not regarded by us as mental symptoms of tumor and were therefore not included in this study.

Unusual difficulties were encountered in the attempt to determine the presence or absence of changes in personality. Strictly speaking a patient who shows symptoms of any disease, physical or mental, exhibits a change in his psychosomatic integration, and consequently a change in personality. To draw conclusions from descriptions given by friends or relatives as to the patient's change in personality would be pure conjecture. Therefore the heading "changes in personality," used in our previous classifications of mental symptoms in brain tumor, was omitted here.

Our method of approach in analyzing the various mental symptoms seemed to be the most feasible for our purposes. By employing this method we do not wish to imply that there exists a definite separation of the various psychic functions, for example of intellect and emotion or of memory, intellect and emotion. We do not mean to revert to the old physiologic theory which conceived of mind as an aggregate of compartments into each of which, as White<sup>4</sup> said, "was pigeonholed a special faculty such as feeling."

From the neurologic service of the Mount Sinai Hospital.  
1 Strauss, Israel and Keschner, Moses. Mental Symptoms in Cases of Tumor of the Frontal Lobe. Arch. Neurol. & Psychiat. 33: 986 (May) 1935.

2 Keschner, Moses, Bender, Morris B. and Strauss, Israel. Mental Symptoms in Cases of Tumor of the Temporal Lobe. Arch. Neurol. & Psychiat. 35: 572 (March) 1936.

3 Keschner, Moses, Bender, Morris B. and Strauss, Israel. Mental Symptoms in Cases of Subtentorial Tumor. Arch. Neurol. & Psychiat. 37: 118 (Jan.) 1936.

4 White, W. A. Outlines of Psychiatry, ed. 3. Washington: D. C. Nervous & Mental Disease Publishing Company, 1911, p. 6.

thinking, and volition, each one of which was considered distinct from the others." We fully realize that an abnormal mental state is the expression of an interference with the functioning of the various mechanisms subserving the sensorium, association, perfection and elaboration of sensory impressions, affect, memory and orientation, speech and intellect, and the sum total of these, behavior

A survey of the literature on the symptomatology of tumor of the brain discloses that some observers have reported the presence of mental symptoms in only 8 per cent of cases while others have found them in every case.<sup>5</sup> This statistical disparity is encountered in the reports not only as to frequency but also as to the nature of the mental symptoms. This may be due

Hallucinations were observed most frequently in patients with supratentorial tumor. They were recorded in 103 instances<sup>6</sup> (19 per cent). The types of hallucinations, in the order of their frequency, were crude auditory, crude visual, formed visual, olfactory, formed auditory, gustatory and haptic. The hallucinations were usually fleeting in character. In many instances the patients had no insight, but from their behavior it was evident that they reacted to hallucinations.

The crude auditory hallucinations, noted in patients with tumor above the tentorium and in whom the peripheral neural pathways were not diseased, were described as ringing, hissing, whistling, gushing water, buzzing or grinding. These sounds were heard most often in the ear on the side of the tumor. Complex

TABLE 1—Location and Histologic Nature of Tumors

Type of Tumor (Histology) and Location in Brain	Number of Cases in Each Group	All Types of Gliomas	Meningiomas	Metastatic Carcinomas	All Types of Sarcomas	Neurofibromas	Pituitary Adenomas	Tumors of Hypophyseal Stalk	Pinealomas	Tuberculomas	Papillomas	Angiomas	Cholesteatomas	Osteochondromas	Gumma	Colloid Cyst	Cysticercus Cyst	Unclassified Cyst	Unclassified Tumor	Ependymomas	Glioma and Carcinoma in Same Patient
Multiple	29	4	1	17	5								1								1
One hemisphere	13	12											1								
Bifrontal	13	8	0	1																	
Frontal	53	28	17	5	2														1		
Frontoparietal	27	15	10	1														1			
Frontoparietotemporal	15	8	6																		
Frontotemporal	21	8	8			1				1	1		1	1							
Temporal	56	38	11	3	3	1								1							
Temporo occipital	12	6	3	1							2										
Temporoparietal	18	11	1	1	2													1	2		
Temporoparieto occipital	13	11	2																		
Parietal	32	16	8	4								2									
Parieto occipital	11	7	1	1	1										1			1	1		
Occipital	11	4	2	2	1						1	1									
Basal ganglions and lateral ven tricle	14	14																			
Intrasellar and suprasellar	36		4				16	15											1		
Third ventricle	15	7			1	4										1			1	1	
Pineal	10	1							9												
Cerebellar	74	42	11	7	6					3											
Cerebellopontile angle	36	1	5	2	27																
Brain stem	19	11	6														1		1		
Total supratentorial	401	198	77	37	16	6	16	15	9	2	4	3	3	2	1	1	0	3	6	1	1
Total infratentorial	129	54	22	7	8	27				3				2			1	8	7		
Grand total	530	252	99	44	24	33	16	15	9	5	4	3	3	2	1	1	1	11	13	1	1
Without mental symptoms	118	48	21	8	4	21	2	2	2	4		2	1		1				7		
Percentage of each type of tumor without mental symptoms	22	19	21	7	16	64	13	13	22	80		66	33		100				54		

to the superficiality and haste with which most patients with tumor of the brain are studied psychiatrically. Routine, painstaking examinations of the mental reactions of these patients may reveal abnormalities which are so fine that they escape detection.

#### DISTURBANCES OF THE SENSORIUM, INCLUDING HALLUCINATIONS

Under disturbances in the sensorium we included the various degrees of increased threshold of consciousness. These were described most commonly as drowsiness, torpidity, somnolence and semistupor. In some cases the descriptive terms "apathy" and "dulness" were used in conjunction with the foregoing terms. Fluctuation in the limen of consciousness was the outstanding characteristic. Lucid intervals, varying from hours to days and even weeks, were not infrequent. Disturbances in sensorium were present in 363 patients (61 per cent) and had practically no localizing value.

auditory hallucinations occurred only in patients with supratentorial tumor, these patients heard melodies or speaking voices.

Patients with crude visual hallucinations complained of seeing flashes of light, colored spots, rings or colored lights. Crude visual hallucinations were observed in patients with tumors located above and, to a lesser extent, in patients with tumors located below the tentorium.

Complex visual hallucinations were unusual in cases of infratentorial tumor.<sup>3</sup> The patients who had complex visual hallucinations saw people or objects that frequently appeared in one field of vision. Usually the object seen in the hallucination was in motion and had a bizarre appearance. Variations in the size of the hallucinatory objects visualized, such as micropsia (lilliputianism) and macropsia (gigantism), were noted in one case. Deja vu phenomena, sometimes attributed to lesions of the temporal lobe, were conspicuously absent in this series of patients.

6 This number does not include the instances of paresthesias or other haptic hallucinations in patients with tumor involving the parietal lobe or of tinnitus in patients in whom the tumor was located below the tentorium.

<sup>5</sup> Schuster P. Psychische Störungen bei Hirntumoren. Stuttgart, 1902. Knapp P C. The Mental Symptoms of Cerebral Tumor. Brain 20:35, 1907. Baruk H. Les troubles mentaux dans les tumeurs cerebrales. Paris thesis, 1926. Henry C W. Mental Phenomena Observed in Cases of Brain Tumor. Am J Psychiat 12:414 (Nov.) 1932.



Most patients with olfactory hallucinations complained that they smelled disagreeable odors. Olfactory hallucinations were recorded in patients in whom the tumor was located usually on the undersurface of the cerebral hemispheres.

Three patients had gustatory hallucinations, two complained of a bad taste, and one of a sweetish taste.

Localized paresthesias or the abnormal sensations described as jacksonian sensory fits were most commonly found in patients with tumor of the parietal lobe opposite to the side of the haptic hallucinations. Several patients stated that they felt bugs creeping over the head and body. Some patients had hallucinations in two or more spheres. Dream states and uncinata fits were not infrequently associated with olfactory or with gustatory hallucinations.

and a few had spells of involuntary crying and hughing. Suicidal trends were rare. When the patient realized that he was seriously ill, he reacted in some form of depression. A few patients, however, were depressed before they became aware that they were ill.

In our series it was found that irritability or some form of mental depression frequently appeared early in the course of the disease. It was not until insight and judgment had become defective, and this occurred in most instances late in the course of the disease, that other disturbances in the affect, such as euphoria and facetiousness, made their appearance. Although facetiousness was slightly more common in patients with tumor of the frontal lobe, the general incidence of this symptom was so low that not much localizing significance could be attached to it. Euphoria and facetiousness

TABLE 2—The Incidence and Type of Mental Symptoms and Location of the Tumor in Brain

Type and Location of Tumor	Number of Cases in Each Group	One or More Mental Symptoms in Same Patient	Changes in Sensorium	Changes in Affect	Euphoria and Facetiousness in Same Patient	Euphoria	Facetiousness	Euphoria or Facetiousness or Both	Memory or Orientation or Both	Changes in Intellect and Higher Psychic Functions	Sphincteric Disturbances	Mental Changes as Early Symptoms of Brain Tumor	All Types of Mental Changes in Same Patient	All Types of Hallucinations	Delusions
Multiple	29	29	23	23	4	4	1	9	18	18	10	7	13	10	4
One hemisphere	13	10	8	5	0	3	0	3	3	3	2	0	0	2	0
Bifrontal	15	13	12	10	6	0	2	8	9	10	5	5	8	1	1
Frontal	53	45	32	30	6	0	7	16	25	22	13	12	10	9	4
Frontoparietal	27	22	15	13	3	3	1	7	9	8	2	4	3	6	0
Frontoparietotemporal	15	13	11	8	1	2	0	3	10	5	6	3	1	3	4
Frontotemporal	21	17	15	11	3	2	1	6	10	11	3	4	4	4	1
Temporal	56	52	42	34	6	7	4	17	32	28	11	16	17	18	4
Temporo occipital	12	12	11	4	0	1	0	1	4	6	1	0	1	3	1
Temporoparietal	18	17	14	7	0	0	1	3	6	5	2	3	1	4	0
Temporoparieto occipital	13	11	9	6	1	2	0	3	7	5	0	2	0	4	0
Parietal	32	26	22	12	1	0	0	3	8	12	2	6	3	7	1
Parieto occipital	11	9	7	7	2	0	0	3	7	7	4	4	6	4	0
Occipital	11	9	7	5	1	1	0	2	5	4	3	1	3	3	0
Basal ganglions and lateral ventricle	14	10	10	10	1	1	0	2	7	7	3	2	5	2	5
Intracellar and suprasellar	36	32	22	20	5	3	0	10	12	15	6	2	7	3	0
Third ventricle	10	8	6	6	0	0	0	2	2	5	0	1	4	3	0
Pineal	10	8	6	4	0	4	1	7	5	7	7	4	3	5	1
Cerebellar	74	31	30	16	2	4	1	3	4	5	1	1	1	2	0
Cerebellopontile angle	36	15	9	9	1	1	0	1	1	4	1	1	0	1	0
Brain stem	19	11	9	5	0	1	0	1	1	4	1	1	0	1	0
Total supratentorial	401	351	275	215	43	36	19	98	151	178	77	73	80	91	1
Total infratentorial	129	61	48	30	3	6	2	11	10	16	9	7	9	8	1
Grand total	530	412	323	245	46	42	21	109	161	194	86	80	89	99	2

From these observations it is evident that the occurrence of hallucinations other than tinnitus in a patient with tumor of the brain makes it probable that the tumor is located above rather than below the tentorium. Further localization of the tumor in the brain may be ventured from the following observations. The presence of complex visual and auditory hallucinations suggests that the tumor might be growing in the temporal lobe, complex visual hallucinations in one lateral field of vision would place the tumor in the temporal or occipital lobe opposite to the side of the field of visual hallucinations.<sup>2</sup> Localized haptic hallucinations are most commonly found in patients with tumor of the parietal lobe on the side opposite to the hallucination. Tinnitus, whether present in patients with supratentorial or infratentorial tumor, is usually on the side of the tumor.

CHANGES IN AFFECT

The general mood of patients with brain tumor was that usually observed in organic diseases of the brain. Disturbances in the affect were present in 245 patients (46 per cent). Hyperirritability, depressions and states of anxiety were frequent symptoms. Emotional instability was also common, many patients cried readily

and a few had spells of involuntary crying and hughing. Suicidal trends were rare. When the patient realized that he was seriously ill, he reacted in some form of depression. A few patients, however, were depressed before they became aware that they were ill.

CHANGES IN INTELLECT AND THE HIGHER PSYCHIC FUNCTIONS

Defects in memory and in orientation varied in severity in the same and in different patients. The most common disturbance was in the recent memory. Several patients confabulated freely. In many instances confusional states were noted, and these were usually transitory. Disorientation, associated with defects in memory, was observed in patients with severe mental impairment. Disturbances in memory and in orientation were predominantly more frequent in patients with tumor above the tentorium, in 181 patients (47 per cent) with tumor above the tentorium and in only ten patients (9 per cent) with tumor below the tentorium. From this standpoint, these symptoms may have localizing value. The value, however, is slight.

## CHANGES IN INTELLECT AND HIGHER PSYCHIC FUNCTIONS

Under disturbances in the intellect and higher psychic functions we included psychomotor retardation, poor reasoning ability, poor autocriticism, mental fatigability, poor calculation, mental deterioration, chronic confusional states and deliriums. Again these disturbances were more common among patients with supratentorial tumor rather than in those with infratentorial tumor. Changes in intellect and higher psychic functions were found in 178 patients with supratentorial tumor (44 per cent) and in sixteen patients with infratentorial tumor (12 per cent).

## SPHINCTERIC DISTURBANCES

The sphincteric disturbances were most often in the form of urinary retention or incontinence. When the mental symptoms were severe and manifold, there also occurred incontinence of feces. Sphincteric disturbances have little localizing significance. They were recorded in eighty-six instances (16 per cent) of the entire series.

## MENTAL CHANGES IN ALL PSYCHIC SPHERES

A patient was regarded as having changes in all psychic spheres whenever he presented the clinical picture of a psychosis such as that found in any type of organic disease of the brain. Some of these patients presented mental symptoms similar to those exhibited by patients with dementia paralytica, Alzheimer's disease or Korsakoff's psychosis. In a small number of patients the mental picture simulated the affective psychoses, such as manic depressive insanity or schizophrenia. There was no psychosis or mental syndrome that was found to be characteristic of brain tumor.

Disturbances in all psychic spheres among patients with tumor above the tentorium occurred in eighty-nine cases (22 per cent), while among patients with tumor below the tentorium there were four cases (3 per cent).

## MENTAL CHANGES AS EARLY SYMPTOMS OF BRAIN TUMOR

In most patients with tumor of the brain, mental disturbances occur, as a rule late in the course of the ailment. Mental changes as early symptoms occurred more frequently in patients with supratentorial tumor (seventy-three cases, or 18 per cent) than in patients with infratentorial tumor (seven cases, or 5 per cent). When mental symptoms appear early in the disease they are usually mild and may be varied in type. In our series the mental symptoms that appeared early were, in order of their frequency of occurrence: defects in memory, irritability, drowsiness, emotional instability, anxiety, depressed states, intellectual enfeeblement, paranoid trends, complex and crude hallucinations, euphoria, facetiousness and sphincteric disturbances. As early symptoms, mental changes were slightly more common in patients in whom the duration of symptoms before the recognition of the tumor was short. As a corollary to this it was found that, in patients with slow growing tumors in whom the symptoms were mild and of long standing before the tumor was recognized, mental disturbances as early symptoms were uncommon. For instance of thirty-six patients with hypophysial tumor in whom the course of the disease was of long duration, only two had mental changes as early symptoms. The foregoing observations appeared more striking when mental changes were considered from the standpoint of initial symptoms of brain tumor.

A term often used to describe mental symptoms that occurred early in the course of brain tumor was "changes in character." Relatives complain that the patient seems to have changed in his manner or behavior, if the patient was of a jolly and congenial disposition before the illness he became morose and irritable, if he was energetic and enterprising, he became lazy and indifferent. Some patients who later became placid were described as "neurotic" and irritable in their premorbid state.

Psychogenic reactions were frequently observed in patients who had insight into their condition. The type and degree of reaction were expressions of their premorbid personality. These patients were concerned about their illness and the consequences that might ensue. Some exaggerated their symptoms. By themselves these mental reactions were not considered as mental symptoms of brain tumor in the sense in which we employed them in this investigation.

## MENTAL SYMPTOMS IN RELATION TO THE LOCATION OF TUMOR IN THE BRAIN

The most varied and severe psychic disturbances were found in patients with multiple tumors of the brain. Almost as equally pronounced were the mental symptoms in cases of tumor of both frontal lobes. There was no mental syndrome that was strictly characteristic of any one area of the brain. The similarity in incidence and nature of mental symptoms of the frontal and temporal lobes have been discussed previously.<sup>2</sup> The only appreciable differences noted between the two were the type and the incidence of hallucinations. Olfactory and complex visual and auditory hallucinations predominated in the cases of tumor of the temporal lobe. Facetiousness was somewhat more frequent in patients with tumor of the frontal lobe, and hypokinesia, though present in both frontal and temporal was also somewhat more frequent in the cases of frontal lobe tumor.

Patients with tumor of the parietal lobe showed fewer mental symptoms than those in whom the tumor was in the frontal temporal or even occipital lobe. The presence of haptic hallucinations on the side opposite to the tumor was of localizing value, it usually implied involvement of the parietal lobe.

Except for qualitative changes in the affect in patients with aphasia, there was no significant difference in the mental symptoms caused by tumors of the left and those caused by tumors of the right side of the brain. When a patient with aphasia realized that his speech was faulty, usually because of anomia, he became worried and depressed. When he did not realize that his speech was faulty, he failed to understand why his words brought no adequate response from people with whom he was conversing or why they attempted to communicate with him by what was to him a meaningless succession of sounds, owing to auditory aphasia. Consequently he became annoyed, irritable and sometimes very excited. Not infrequently he gave up in despair and became depressed.

There was no noteworthy difference in the mental symptoms in patients in whom the tumor was located in and about the ventricular system, as compared with those in whom the tumor was located in other parts of the cranial cavity. In cases of hypophysial tumor, mental symptoms were seldom early manifestations of the disease.

The mental symptoms in patients with tumor below the tentorium found in sixty-one cases (47 per cent) were much milder and less complex than those in the

<sup>2</sup> Strauss, Israel. The Initial Symptoms and Early Diagnosis of Tumor of the Brain. *Bull. New York Acad. Med.* 12: 46 (Aug.) 1936.

patients with tumor above the tentorium found in 351 cases (87 per cent). Marked mental changes occurred, sometimes in patients with infratentorial tumor, but not nearly as frequently as in patients with supratentorial tumor. Except for tinnitus on the side of the tumor, hallucinations in patients with posterior fossa tumor were rare and, when present, were of the crude visual type.

This study would seem to show that mental symptoms by themselves have little or no value in localizing a tumor of the brain. All that can be said is that (1) mental symptoms are more frequent, severe and varied and more apt to appear early in the disease in patients with supratentorial tumor, (2) complex visual and auditory hallucinations are more frequent in tumors of the temporal lobe than in those of any other portion of the brain.

#### PATHOGENESIS OF MENTAL SYMPTOMS IN CASES OF BRAIN TUMOR

It is impossible to state with any degree of certainty which factors were responsible for the mental reactions (organic type) in patients with tumor of the brain. We found that the most pronounced mental disturbances were observed in patients in whom the tumor involved both cerebral hemispheres. A large amount of tissue destroyed in the cerebral hemisphere on one side (hemispherical tumors) did not cause the severe and psychic changes that resulted when even a smaller amount of tissue was destroyed in cerebral hemispheres on both sides. The bifrontal, corpus callosum and multiple tumors gave the most varied, most pronounced mental symptoms in almost every instance. The more rapidly the symptoms of a brain tumor appeared, the greater was the possibility that mental symptoms would be manifest. The rapidity of the growth of the tumor was a determining factor in the frequency of occurrence and severity of the mental symptoms. Among the patients in this series who did not show mental symptoms, the tumors were predominantly of the slow growing type, e. g., pituitary adenoma, astrocytoma, neurofibroma, meningioma, tuberculoma, angioma and gumma. It was difficult to ascribe mental symptoms to intracranial hypertension because intracranial hypertension was present in a majority of patients with tumor of the brain. This was particularly evident in individuals with tumor of the posterior fossa. Despite this, mental changes—even changes in the sensorium, which some authors ascribe to increased intracranial pressure<sup>8</sup>—were not nearly as common in patients with tumor below the tentorium as they were in those with supratentorial tumor. Intracranial pressure may, however, be a contributing factor when it increases suddenly or rapidly. The age, general condition and premorbid personality of the patient were factors that modified the nature of psychic reaction to physical symptoms produced by the tumor.

#### SUMMARY AND CONCLUSIONS

1 A series of 530 patients with brain tumor was studied in order to determine the frequency of occurrence, nature and localizing value of abnormal mental reactions during the course of the disease.

2 There are no mental symptoms that are specific for brain tumor.

3 Mental symptoms are almost twice as frequent in patients with supratentorial as in those with infratentorial tumor of the brain.

4 Disturbances in memory are predominantly more frequent in individuals with supratentorial tumor than in those with infratentorial tumor.

5 Complex visual and auditory hallucinations are more frequent in patients with tumor of the temporal lobe.

6 Crude auditory hallucinations are heard by the patients most commonly on the side of the tumor, whether the tumor is located above or below the tentorium.

7 Localized tactile hallucinations indicate that the parietal lobe opposite to the side of the hallucination is the seat of the tumor.

8 The most severe and most varied type of psychic disturbances are observed in patients in whom the tumor involves both sides of the brain.

9 Psychogenic reactions are determined more frequently by physical or by subjective disabilities and by the total personality of the individual rather than by the location of the tumor in any one part of the brain.

10 The pathogenic factors in the production of mental symptoms, in the order of their importance, are (a) involvement of both sides of the brain, (b) increased rate of development of symptoms of tumor of the brain in general, (c) the rapidity of the tumor growth, (d) sudden appearance and rapid development of intracranial hypertension and (e) supratentorial location of the tumor.

11 The age, general condition and premorbid personality of the patient modify the quality of the mental reactions to physical symptoms.

#### THE TESTING OF ACTIVITY OF CHILDHOOD TUBERCULOSIS

RELATIVE VALUE OF THE SCHILLING DIFFERENTIAL COUNT, THE SEDIMENTATION RATE AND THE LYMPHOCYTE-MONOCYTE RATIO

W. AMBROSE MCGEE, MD

RICHMOND, VA

The frequent use of the intracutaneous tuberculin test has done much in bringing to light early childhood tuberculosis. Even with a history of exposure and x-ray evidence it is difficult to decide whether the tuberculous infection is active. Reliance on clinical courses is often not sufficient.

In the past few years many excellent reports have shown certain laboratory aids to be of great prognostic value for adults with tuberculosis. On the other hand little such data have been presented relative to childhood tuberculosis, the best reports being concerned with the number of lymphocytes and monocytes. Any simple tests that would throw light on the activity of tuberculosis in childhood or on its prognosis would be of great value.

Through the cooperation of Drs W. E. Brown, Frank B. Stafford and E. C. Cole of Blue Ridge Sanatorium, Charlottesville, Va., a study of the relative value of the Schilling differential blood count, the sedimentation rate and the lymphocyte-monocyte ratio was made on forty children over a period of approximately six months. The sedimentation rate and the total cell counts were determined by a trained technician at the sanatorium, and the Schilling differential count and the lymphocyte-monocyte ratio were determined by me in another city. The supravital staining

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was not used in studying the monocytes. Friedman and his associates<sup>1</sup> did not find any great difference between lymphocyte-monocyte ratios obtained by the ordinary stain and by the supravital method and considered the former much simpler and more practical. At various times the physical and clinical data found

TABLE 1—*The Relative Value of the Schilling Differential Blood Count, the Sedimentation Rate and the Lymphocyte-Monocyte Ratio in Testing the Activity of the Tuberculosis of Childhood*

1 The Schilling Differential Blood Count

The greater the percentage of immature neutrophils present the more severe the infection or damage to tissue. The division of the immature neutrophils (myelocytes plus juveniles plus stabs) by the total neutrophils (myelocytes plus juveniles plus stabs plus segments) gives the percentage of immaturity or the so-called shift to the left percentage.

Normal	Slight Infection	Moderate Infection	Severe Infection	Very Severe Infection
4.13%	16.30%	31.50%	51.70%	71% or greater

2 The Sedimentation Rate

The distance in which citrated red blood cells settle in a certain size small tube in a given period represents the injury to the red cells from an infection or change in tissue. The more rapid the rate the more severe the infection or derangement of tissue.

Normal	Slight Infection	Moderate Infection	Severe Infection	Very Severe Infection
0-10 mm	11-15 mm	16-20 mm	26-30 mm	31 mm or greater

3 The Lymphocyte Monocyte Ratio

An increase in the number of lymphocytes with a normal percentage of monocytes represents the tendency to healing and conversely a low lymphocytic and a high monocyte percentage suggest a more severe infection and a greater tendency to extension of the infectious process.

by Drs. Brown, Stafford and Cole were compared with the laboratory data. I feel that the study, even though of short duration and concerned with so few children, is of sufficient interest to report.

It is common knowledge that at autopsy one finds in a single case lesions of all stages. By studying all leukocytes in the circulating blood, one can get a good mental picture of the pathologic changes taking place. Such a study must of course be undertaken under similar conditions and at regular intervals, and the differential count had best be done by the same person to get optimum results.

The tuberculosis of the children in the series was classified as suspicious, minimal, moderately advanced and far advanced.

The brunt of the attack against the tubercle bacillus in all of its stages is borne by the monocytes, the neutrophils and the lymphocytes appear to be adjutants only. Sabin<sup>2</sup> and Blackfan<sup>3</sup> have found the monocyte to be concerned with the spread of the disease and with the formation of new tubercles. The damage to tissue resulting from the monocyte-tubercle bacillus fight causes stimulation of the bone marrow, which in turn gives rise to cellular changes in the circulating blood.

A consideration of the percentage of immature neutrophils in relation to the mature polymorphonuclears gives an excellent idea of the severity of an acute infection in childhood.<sup>4</sup> Normally about 5 to

15 per cent of neutrophils are immature, while in infections that percentage increases. In an infection of slight severity one finds about 16 to 30 per cent, in a moderate infection about 31 to 51 per cent and in a very severe infection from 51 to 70 per cent, while a percentage of over 70 for a prolonged period is suggestive of impending death. The appearance of the nucleus and its cytoplasm also aids in determining toxicity,<sup>5</sup> when the nucleus is greatly distorted and the cytoplasm filled with deeply stained granules, one is dealing with a very severe infection.

The percentage immaturity of neutrophils, or the so-called shift to the left, in this small series was in keeping with the interpretation just mentioned. A shift of from 20 to 40 per cent was finally found for the group with tuberculosis classified as suspicious or minimal. In the cases of moderately advanced tuberculosis a percentage of from 25 to 40 was generally seen, while in the cases of far advanced infection the immaturity was in the neighborhood of from 50 to 80 per cent. Only in the last named group were toxic granules noted. Occasionally the shift was out of keeping with the clinical classification, such shifts were felt to represent a truer picture of the manner in which the child is handling his tuberculous infection than x-ray or clinical evidence. This is in agreement with Flinn.<sup>6</sup>

The rapidity of the sedimentation rate gives some measure of the intensity of an infection or derangement of tissue. A series of such rates should give prognostic information. The normal sedimentation rate within one hour is considered to be ten millimeters or less.<sup>7</sup> In the cases of minimal activity in this series the rate was

TABLE 2—*The Schilling Differential Blood Count for W. B., Aged 9 Years, Who Had Tuberculosis Classified as Suspicious*

Date	Basophils	Eosinophils	Myelocytes	Juveniles	Stabs	Segments	Lymphocytes	Monocytes	Shift Per centage	Comment
12/14/32	0	4	0	0	10	31	51	4	24	Old tuberculin test positive 0.01 mg
1/2/33	0	8	0	1	0	33	50	3	15	
1/18/33	0	9	0	0	10	39	36	6	21	
2/2/33	0	4	0	0	16	32	44	4	33	
2/10/33	0	7	0	1	17	27	42	6	40	
2/28/33	0	9	0	0	8	35	44	4	19	
3/16/33	1	11	0	0	18	23	31	6	35	Asthma
4/4/33	1	10	0	1	10	27	44	7	29	Asthma
5/8/33	1	8	0	0	4	36	49	2	10	Improved

Comment—The first count is in agreement with the classification so far as the severity of the infection is concerned. At the time of discharge the blood picture showed a normal shift and a normal percentage of monocytes with increased lymphocytes. The sedimentation rates were 5 mm, 4 mm, 9 mm and at discharge 8 mm. On May 8 the infection had become inactive and healing had occurred.

within the normal range or occasionally as high as fifteen millimeters. When there was moderately advanced tuberculosis a rate of from fifteen to twenty millimeters was noted, and in the cases of far advanced infection a rate of more than twenty millimeters was usually observed. While it is realized that anemia itself will

1 Friedman, Eli, Dameshek, William and Hawes, John B. 2d. The Examination of the Blood as an Aid in the Diagnosis of Human Lymph Node Tuberculosis. *Am. Rev. Tuberc.* 25: 24-31 (Jan.) 1932.

2 Cunningham, R. S., Sabin, F. R., Sugiyama, S. and Kindwall, J. A. Role of the Monocyte in Tuberculosis. *Bull. Johns Hopkins Hosp.* 37: 251 (Oct.) 1925.

3 Blackfan, K. D. and Diamond, L. K. The Monocyte in Active Tuberculosis. *Am. J. Dis. Child.* 37: 233-234 (Feb.) 1929.

4 McGee, W. Ambrose. The Value of the Schilling Differential Blood Count in Pediatrics. *South M. J.* 25: 484-489 (May) 1932.

5 McGee, W. Ambrose. The Importance of Immature White Blood Cells in Diseases of Children. *South M. J.* 28: 43-46 (Jan.) 1935.

6 Flinn, John W. and Flinn, Robert S. The Leukocytic Picture of the Blood as an Aid in the Treatment of Pulmonary Tuberculosis. *Am. Rev. Tuberc.* 20: 347-357 (Sept.) 1929.

7 Cutler, J. W. The Practical Application of the Blood Sedimentation Test in General Medicine. *Am. J. M. Sc.* 183: 643-659 (May) 1932.

give rise to an abnormal sedimentation rate, I feel that an attempt to correct the rate for the anemia<sup>8</sup> is not advisable, as the anemia is part of the clinical course.

In a few instances, as with the Schilling differential count, the sedimentation rates did not parallel the clinical course of the tuberculosis. In such instances

TABLE 3—The Schilling Differential Blood Count for M G, Aged 11 Years, Who Had Tuberculosis Classified as Minimal

Date	Basophils	Eosinophils	Myelocytes	Juveniles	Stabs	Segments	Lymphocytes	Monocytes	Shift Per centage	Comment
12/14/32	0	4	0	2	18	27	44	5	43	Test with old tuberculin positive, 0.01 mg.
1/6/33	0	0	0	1	12	39	44	4	25	
1/19/33	1	0	0	2	18	39	36	7	42	
2/2/33	1	2	0	2	9	41	30	10	21	
2/15/33	2	5	0	0	8	31	43	11	22	
2/28/33	0	6	0	0	10	49	33	2	18	
3/17/33	1	4	0	3	18	30	39	5	41	
4/8/33	0	4	0	2	17	30	34	8	35	
5/6/33	0	4	0	0	17	37	31	11	31	
11/29/33	0	1	0	0	18	41	36	4	13	Improved

Comment—The first count is in agreement with the classification so far as the severity of the infection is concerned. At the time of the last count the shift was normal, the percentage of lymphocytes slightly increased and the percentage of monocytes normal. The sedimentation rates were 13 mm, 9 mm, 13 mm and 4 mm. On November 29 the infection was nonactive and healing was taking place.

it is felt that it is better to rely on the change in the sedimentation rate than on clinical impression.

Much information has been presented in the study of the lymphocytes and monocytes. It has been shown by many writers that if the number of monocytes is high new tubercles are forming, and that if it is normal or low and there is a gradual increase in the percentage

TABLE 4—The Schilling Differential Blood Count for B W, Aged 9 Years, Who Had Tuberculosis Classified as Moderately Advanced

Date	Basophils	Eosinophils	Myelocytes	Juveniles	Stabs	Segments	Lymphocytes	Monocytes	Shift Per centage	Comment
2/2/33	0	0	0	14	2	10	50	14	80	Test with old tuberculin positive, 0.02 mg.
2/10/33	1	2	0	11	40	15	22	9	73	
3/9/33	0	0	0	3	40	14	30	13	76	
3/17/33	0	4	0	3	45	8	36	1	86	
4/4/33	0	1	0	8	46	8	26	11	87	
5/6/33	0	1	0	10	02	11	16	10	80	
12/13/33	0	2	0	3	36	20	34	0	66	Slightly Improved

Comment—All counts showed evidence of a far advanced or very toxic type of infection. The shift remained extremely high, the percentage of lymphocytes was very low and the percentage of monocytes was usually high. The sedimentation rates were 34 mm, 36 mm, 30 mm and 31 mm. The laboratory data disagreed with the clinical classification. The patient subsequently died.

of lymphocytes healing is taking place. In this study the number of monocytes was found to fluctuate so greatly that it was difficult to form any definite opinion. In cases of minimal tuberculosis it was usual to find the monocyte count between 2 and 9 per cent, in cases of moderately advanced infection, between 4 and 10 per cent, and in cases of far advanced infection,

between 7 and 15 per cent, usually above 10 per cent. When patients were improving clinically the monocytes were generally below 8 per cent, while the lymphocytes were in the neighborhood of 40 per cent or more and the immature neutrophils were less than 30 per cent.

In childhood the number of lymphocytes is normally so high that it is more difficult to get information than in cases of adult tuberculosis, so in studying the percentage of lymphocytes one has to have in mind what is to be expected for the age of the child in question.

In ordinary acute infections of childhood a sudden rise in monocytes usually foretells the dawn of convalescence.<sup>9</sup> This is not true in tuberculosis. Like wise when there are four times more lymphocytes than monocytes, provided the latter are present in normal numbers, healing is apt to be taking place. No such impression could be derived from the ratio between lymphocytes and monocytes in this study. However, for the patients with far advanced tuberculosis who

TABLE 5—The Schilling Differential Blood Count for L C, Aged 11 Years, Who Had Tuberculosis Classified as Far Advanced

Date	Basophils	Eosinophils	Myelocytes	Juveniles	Stabs	Segments	Lymphocytes	Monocytes	Shift Per centage	Comment
1/19/33	1	2	0	10	16	34	57	10	44	Positive sputum
2/2/33	0	3	0	4	22	30	30	6	46	
2/15/33	0	0	0	5	27	31	20	12	51	
2/28/33	0	3	0	1	41	29	22	4	58	Pneumothorax
3/16/33	0	5	0	6	34	21	22	12	66	
4/7/33	1	2	0	1	24	30	23	13	45	
5/11/33	0	2	0	1	27	37	20	8	43	Pneumonolysis
12/9/33	2	1	0	3	20	42	23	4	37	Improved

Comment—The shift in most instances represents a less severe infection than a far advanced type of tuberculosis. The high shift and the high percentage of monocytes indicate new tubercle formation with suppuration. The relatively low percentage of lymphocytes is in keeping with little or no healing. In the last count improvement is seen with some slight suggestion of healing. The sedimentation rates were 25 mm, 31 mm, 30 mm and 39 mm. The sedimentation rates as a whole disagreed with the shift and the clinical improvement.

were not improving clinically as well as for private patients with primary tuberculosis, it was usual to find a very low lymphocytic percentage with a very high monocytic one. The ratio then was about one to one, which would indicate, so far as the lymphocyte monocyte ratio is concerned, absolute absence of healing.

Total white cell counts were not obtained with each weekly or bimonthly blood smear, but, when done, the counts were usually well within the normal range except in the cases in which the infection was far advanced or another infection was superimposed. It was usual to find a white cell count of from 5,000 to 7,500 in the cases of minimal tuberculosis. A study of the size of the different white cells with a micrometer was time consuming and proved of no practical value.

#### COMMENT

1. A study of the cells in the circulation at regular intervals and under similar conditions by the same person gives a mental picture of the pathologic changes occurring.

<sup>8</sup> Walton, A. C. R. The Corrected Erythrocyte Sedimentation Test. *J. Lab. & Clin. Med.* 18: 711-723 (April) 1933.

<sup>9</sup> Gradwohl, R. B. H. The Schilling Blood Methods. *Long* 15-1-1. *M. J.* 24: 261 (May) 1930.

2 The laboratory data per se do not in any way suggest the kind of infectious agent, for red and white cells respond only to the type of damage done to the tissues

3 Total white cell counts per se are of relatively little or no prognostic value but when considered from

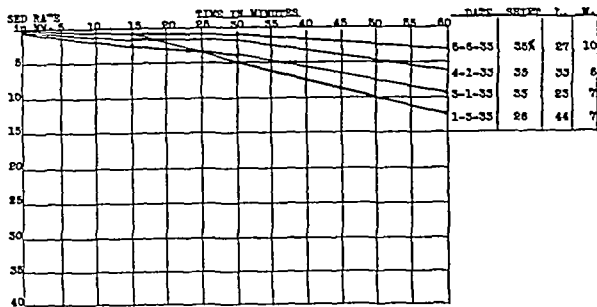


Chart 1—Sedimentation rates for S B aged 13 with tuberculosis classified as suspicious. In this and the accompanying charts the horizontal line indicates from normal activity to quiescence, the diagonal line from quiescence to slight activity, the diagonal curve from slight to moderate activity and the vertical curve from moderate to marked activity. The sedimentation rates shown in this chart agree with the clinical classification but all except the first are normal, whereas the shift shows evidence of slight activity throughout. The percentage of monocytes is relatively high and the percentage of lymphocytes nearly normal for age.

the standpoint of total neutrophils, lymphocytes and monocytes are of value<sup>10</sup>

4 Through a consideration of the maturity of the neutrophils or the sedimentation rate, the best prognostic information is obtained

5 Any definite lymphocyte-monocyte ratio was unobtainable because of the great fluctuation in the monocyte percentages. However, a normal monocyte count with an elevated lymphocyte count indicates healing, whereas, the reverse ratio suggests extension of the tuberculous infection

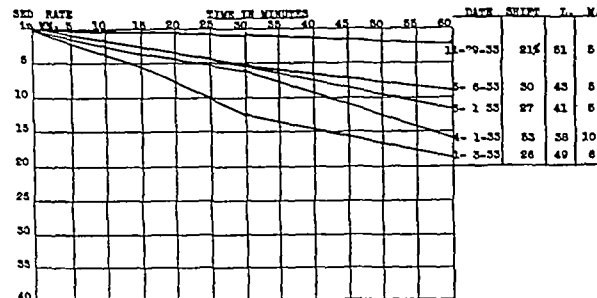


Chart 2—Sedimentation rates for B J C aged 9 years with tuberculosis classified as minimal. The first sedimentation rate, shift, percentage of lymphocytes and percentage of monocytes are in agreement with the clinical classification. The last sedimentation rate, shift and percentage of monocytes are normal while the percentage of lymphocytes is high indicating inactivity of infection with good healing.

6 When clinical courses do not parallel laboratory data, especially the shifts and the sedimentation rates, it is advisable to pay more attention to those two tests

7 Evidence of relapse or retrogression is first noted in the Schilling shift days or weeks prior to roentgenographic or physical evidence

8 A continuous septic type of blood picture is more suggestive of extension of the pathologic process, and there is danger of hemorrhage

9 The blood picture indicates the status of the infection only at the time the blood is obtained for study

### SUMMARY

1 It is possible and practical from a study of the blood under regular conditions to secure reasonably reliable prognostic information

2 Greater prognostic aid is obtained from the shift and the sedimentation rate than from the lymphocyte-monocyte ratio per se

3 Earlier pathologic changes are shown by the shift

4 In cases of moderately or far advanced tuberculosis the shift and the sedimentation rate more or less parallel each other. When the tuberculous infec-

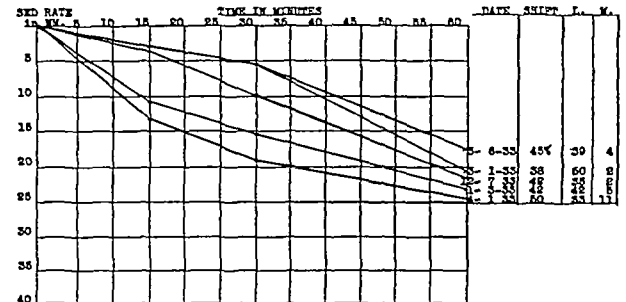


Chart 3—Sedimentation rates for D G aged 15 with tuberculosis classified as moderately advanced. The sedimentation rate and the shift as well as the percentage of lymphocytes and of monocytes are in agreement with the clinical classification. The first sedimentation rate and shift indicate only slight improvement. The percentage of lymphocytes is relatively high and the percentage of monocytes normal, suggesting healing and no new tubercle formation. They disagree with the shift and the sedimentation rate.

tion is slight the shift is usually slightly elevated while the sedimentation rate is generally normal

5 The Schilling count or a modification of it is more practical for children and has many advantages over the sedimentation test. Some of the outstanding points in favor of the Schilling differential count are as follows:

- (a) Less blood is required
- (b) Children have much less fear of finger pricks than of venous punctures
- (c) All kinds of blood cells can be studied in a stained smear

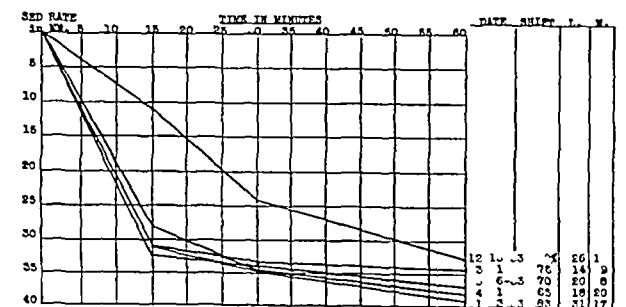


Chart 4—Sedimentation rates for H W aged 13 with tuberculosis classified as far advanced. The sedimentation rate, shift, percentage of lymphocytes and percentage of monocytes agree with the clinical classification. There was relatively no improvement during the entire course of the study. The c data are in keeping with the clinical course.

- (d) Less time is required
- (e) Differential counts can be made days after a slide is stained
- (f) Stained smears can be kept as a semipermanent record

<sup>10</sup> Medlar E M. An Evaluation of the Leukocytic Reaction in the Blood as Found in Cases of Tuberculosis. *Am Rev Tuberc* 20: 312 (Sept) 1929

(g) Evidence of slight flare-ups and superimposed infections are detected much more quickly and consistently

6 More detailed cellular structure is visible with the use of Giemsa's stain than with Wright's stain

7 A combination of the shift percentage and the progressive changes in the percentage of lymphocytes and monocytes gives the optimum prognostic information. Such a combination also gives a clearer idea of the extent of the infection

8 Laboratory tests should in no way be used to replace clinical and roentgen examinations but should be used regularly in conjunction with them

1601 Monument Avenue

#### ABSTRACT OF DISCUSSION

DR FRANK B. STAFFORD, Charlottesville, Va. It is my intention to talk about the clinical aspect of this work. It was Dr McGee's object to take only a small number of cases but to work out these well in order to evaluate properly the significance of the blood changes that were believed to occur in childhood types of tuberculosis. Cases were selected which would represent all phases of the disease. Latent (suggestive), mini-

mal, moderately advanced and far advanced cases show that the Schilling blood count and red cell sedimentation rate in tuberculous children may reveal a spread of the disease weeks before it can be detected by the clinical course. It also seems to have a dependable prognostic value. Four years after discharge from the sanatorium an attempt was made to locate the children on whom this blood work was done to see what their condition was. A study of the accompanying table shows that a report was obtained in 86.5 per cent of the cases and that death had occurred in 60 per cent of the moderately advanced and far advanced cases in which an unfavorable prognosis was made. Of the remaining patients located, 96.3 per cent are apparently well and are either working or going to school. All but two in the latter group carried a good prognosis from the sedimentation rate and Schilling counts which were done on them four years ago.

DR J. I. LINDE, New Haven, Conn. I should like to ask whether this is of any value in prognosticating the advance in the tuberculin-positive contacts. I am conducting a study in Negro children and it might be of interest to know whether a Schilling count would be of value in determining what is going to happen to these tuberculin-positive children.

DR W. AMBROSE MCGEE, Richmond, Va. I cannot answer this question positively, but from the study of the Schilling blood count in nontuberculous cases I can state that the procedure usually gives a good deal of information as to whether

*Condition of Children Four Years After Discharge, Showing Prognostic Value of Blood Examination*

Class	Number of Children	Percentage of Immature Neutrophils	Sedimentation Rate in One Hour	History of Contact	Tuberculin		Condition on Discharge				Condition Four Years After Discharge				
					Positive	Negative	Improved	Unimproved	Quiescent	Dead	Number Located	Well	At School	Relapsed	Dead
Suggestive or latent	23	20-40	0-10	19 (83%)	17 (74%)	6	23	0	0	0	18	6	12	0	0
Minimal	9	20-40	10-15	9 (100%)	9 (100%)	0	5	1	3	0	9	3	5	1	0
Moderately advanced	3	20-50	15-20	3 (100%)	3 (100%)	0	0	0	2	1	3	0	2	0	1
Far advanced	2	50-80	20-60	2 (100%)	2 (100%)	0	0	1	0	1	2	0	0	0	2

One child with moderately advanced tuberculosis and one with far advanced tuberculosis died soon after discharge. Thus 60 per cent of the children with moderate and far advanced tuberculosis are dead. Of the remaining twenty-seven children located, twenty-six or 96.3 per cent are apparently well and either working or going to school.

mal, moderately advanced and far advanced groups were included. Special attention was given to the clinical course of the patients during the period this work was under way in order to determine what variations, if any, existed. From previous work by Dr McGee it was believed that it would prove valuable from the standpoint of diagnosis of severity and prognosis in tuberculous children. These two claims were fully justified. Two cases in particular are worth mentioning as to the diagnostic value. An 8 year old girl was confined to bed with a moderately advanced case of pulmonary tuberculosis. She was gaining weight, her temperature was normal and the clinical course indicated improvement. Repeated blood counts by Dr McGee revealed a continuous increase in the percentage of immature white blood cells. He insisted that the child was growing worse and had a bad prognosis, but we doubted this as her symptoms and chest were apparently improving. There was steady resorption of tuberculous exudates in both lungs. After a few weeks the clinical picture was reversed, a tuberculous peritonitis was discovered, and the child went down steadily and died of generalized tuberculosis. A boy, aged 16, was confined to bed with a moderately advanced case of tuberculosis and had tubercle bacilli in his sputum. His fever had subsided, he was gaining weight steadily and otherwise seemed to be improving. The Schilling count revealed an increasing shift to the left, and the red cell sedimentation rate showed a steady drop. A roentgenogram of the chest revealed a spread of disease in the left lung with formation of an excavation. Permission was then given by the parents for artificial pneumothorax, but a continuous extension of the disease in the contralateral lung made the compression unsuccessful and the boy died of fulminating pulmonary tuberculosis. Both of these

a patient is getting better or slipping. If the same technician who performs this follows the same patients at relatively the same intervals and under the same conditions, it will give quite a bit of information. I don't think the sedimentation test will give any information in that stage, and, again, I want to say that in children I feel that a sedimentation test cannot compare with the Schilling count. It has nothing to offer (except in rare instances) that the Schilling will not do, and the Schilling will give all one needs. If one pricks the finger and stains it soon enough, one can refer to it a month later. The sedimentation test takes more time and has to be looked at right away. Both Dr Stafford and I feel that, while the study was of short duration and represented very few children, it is in keeping with the results in acute infections. There is no reason why it should not be of some value to give one an idea of severity or to give one an idea of the prognosis of the particular child in question.

**Time-Lag in Medicine**—The recognition of vitamins is a more recent story. But here the time-lag between the realization of an error in dietary in such diseases as scurvy, beriberi and rickets and the discovery of the actual cause was a much longer one, particularly in the case of scurvy, where the curative effect of lemon juice had been known since the seventeenth century. The long dispute as to whether rickets was a disease of the dark or of diet was at last resolved in a manner satisfactory to both parties when the influence of ultraviolet rays on the production of vitamin D was demonstrated—Largely by Brown and Walter. *The Dead Hand in Medical Science*. L. 1 379 (Jan 29) 1938



## AUDIOMETERS AND HEARING AIDS

AUSTIN A HAYDEN, M.D.

CHICAGO

For the practicing otologist the audiometer<sup>1</sup> is an electrical instrument for measuring hearing in the physician's office. Direct or alternating current may be used. It measures loss of hearing in decibels (db) at calibrated frequencies (pitch) and supplants the old methods, in which the voice, watch, acumeter, tuning forks, rods, bells and whistles were used. The examiner may now increase, decrease or hold stationary the intensity of any frequency on the audiometer for any length of time desired. The decay of the tuning fork always limited its usefulness and was outstanding among the errors inherent in the old methods.

The full hearing range, as it has been taught, from 20 to 20,000 cycles per second, for which former testing equipment was manufactured, is not covered in its entirety by any audiometer exhibited at this meeting. This is largely because of excessive manufacturing costs and doubtful clinical utility. However, the older instruments of precision can and should be used when necessity arises or comparisons are desired.

In general the results of tests with the audiometer are plotted so that frequency runs horizontally across the chart from 64 to 8,192 or over and is calibrated in octaves, half octaves and/or octave letters. Sweeps cover all or part of the octave calibrations and go far beyond these pitches, to as high as 16,000 cycles per second. Intensity is measured in decibels between the threshold of audibility and of pain and is charted vertically. The ordinary telephone receiver transforms the electrical energy of the audiometer into sound cycles for air conduction through the external auditory canal. For bone conduction through the mastoid, a specially constructed receiver is provided.

Additional equipment now available includes maskers, microphone amplifiers for speech articulation tests, plans and specifications for soundproof rooms, rubber receiver cups for use where such rooms are not practical and specially prepared charts.

### HEARING AIDS

Electrical hearing aids raise the sound level for transmission by air through the external auditory canal to the drum and by bone—thanks to Lieber for the bone conduction receiver—through the mastoid to the inner ear. They are portable, semiportable and stationary. The first uses small single or multiple dry cells, the second either large dry cells or line current or both, and the last line current only. This paper deals only with the portable aids because they are the most widely used.

Portables are amplified or nonamplified. They are specially adapted telephone hook-ups, consisting essentially of a receiver (ear piece), transmitter (microphone) and battery. In the amplified set an amplifier, or booster, with its second circuit, is added. Cells

may number from one to four, and the battery delivers from 1½ to 6 volts. Too few or worn out cells prevent sufficient amplification.

The frequency range of portables lies principally from 256 to 2,000 cycles per second, where most conversational tones come. Some amplification is possible as high as 3,500 or 4,000 cycles per second. By altering the construction of the transmitter the sound can be "peaked" at one or more frequencies, by changing the characteristics of the receiver another "peak" is obtained. Thus sound may be "peaked," or intensified, effectively within three divisions (low, middle and high) to fit approximately the loss of hearing shown on an audiogram. Amplification can also be spread out evenly over a fairly broad area. Thus the electrical and mechanical characteristics of the transmitter, receiver and booster, when used in various combinations, afford literally hundreds of different hearing aids. How many are actually practical is an open question.

### RESPONSE CURVES OF HEARING AIDS, AUDIOGRAMS OF HEARING AIDS, MASTER HEARING AIDS

By passing the audiometer's calibrated tones into the hearing aid's transmitter and measuring the output with a decibel meter, the over-all "tone characteristics" of the various arrangements of component parts can be plotted into "response curves" of the hearing aid. The actual change the hearing aid makes in the patient's hearing can be ascertained by attaching the audiometer's ear piece to the transmitter of the patient's hearing aid and charting the audiometer reading of the patient in the usual way. When plotted on the patient's original audiogram, a graphic picture of the hearing before and after fitting is immediately exhibited. This is the audiogram of the hearing aid which will be considered in a subsequent paper.

The audiometer may be compared to the retinoscope. The latter determines both degree and position of errors of refraction. The former locates both position (frequency) and degree (intensity) of loss of hearing. "Tone islands" correspond roughly to astigmatic errors of refraction and indicate the position (frequency-pitch)<sup>2</sup> at which the intensity (loudness) of the hearing aid should be "peaked." Just as the trial frame enables the patient to look through the various lens combinations indicated by the retinoscope, likewise the deafened patient can actually hear through the half dozen combinations indicated by the otologist's audiogram. Carefully worked out<sup>3</sup> speech articulation tests determine the combination best suited to the individual requirements.

This great improvement in fitting has been effected by the development of what, for want of a better generic name, may be called the master hearing aid. All but one of the four largest manufacturers fit from the results of tests with this instrument. The excepted firm uses audiograms only, which are made in its own sales rooms. It audiometric analysis is advertised to be for the fitting of hearing aids only and not for the diagnosis of ear disease. Two firms consider audiograms unnecessary and depend entirely on master hearing aids to make their fittings. The fourth uses its

<sup>1</sup> This work was facilitated by an expense grant from Sonotone Corporation.

<sup>2</sup> Clinical material was obtained from private practice, the Chicago League for the Hard of Hearing and the outpatient department of St. Joseph's Hospital.

<sup>3</sup> Read before the Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Chicago, in October 1937 and in part before the Chicago Laryngological and Otological Society.

<sup>4</sup> A clinical audiometer is an instrument for measuring the acuity and range of hearing. Tentative Minimum Requirements for Acceptable Audiometers. Report of the Council on Physical Therapy. J. A. M. A. 109: 1812 (Nov. 27) 1937.

<sup>2</sup> Pitch is that subjective quality of a sound which determines its position in a musical scale. Loudness is that subjective quality of a sound which determines the magnitude of an auditory sensation produced by that sound. American Standards Association Bulletin of Acoustic Terminology, Oct. 15, 1936.

<sup>3</sup> The need of speech articulation tests is well treated in Ewing, A. W. G. Ewing, I. R. and Little, T. S. Reports of the Committee upon the Physiology of Hearing. IV. The Use of Hearing Aids. Special Report Series No. 219. London: His Majesty's Stat. Off. 1936.

own master hearing aid in addition to an otologist's audiogram, which it believes to be essential

Just how the vacuum tube works in the audiometer, how sound is amplified, how the attenuator sweeps the entire intensity range between the threshold of hearing and that of pain, how to define bel and decibel and how to comprehend sound in terms of drum surface pressure require highly technical knowledge. The hearing aid presents similar problems. Otologists may well leave such matters to the Bureau of Standards, the American Standards Association, the American Medical Association's Council on Physical Therapy and the professional associates and designated consultants of these bodies.

#### TESTS OF AUDIOMETERS

As unnecessary minimum requirements increase the cost and thereby, to some extent, limit the use of any apparatus designed for wide clinical use, it is desirable to determine the value of such requirements. In audiometers pure wave form, which does add greatly to construction costs, has been considered necessary, espe-

steps of 5 decibels. It is provided with an automatic self-compensating pointer. Audiometer Y has an octave, octave letter and sweep frequency range from 64 to 8,192, with attenuation from 0 to 100 decibels at all frequencies. Audiometer Z has two dials, one for sweep frequency marked with eight indicated points from 128 to 9,847. For bone conduction tests, a ring is placed over the intensity dial for recalibration.

When being tested, the patient responded by the usual finger or electric signal. The average of a minimum of three readings based on air conduction at each of the octave frequencies was taken to be the actual loss of hearing and charted as such on the individual audiograms and recorded. These three readings almost never varied from each other by more than plus or minus 5 decibels. The tests were made by three experienced observers. Rest periods were used as needed to minimize the confusion due to fatigue of both the patient and the observer.

Fourteen of the thirty patients were found to have losses of hearing greater than the Western Electric 2-A audiometer could measure. For that reason their audiograms were discarded. The losses of the remaining sixteen, as shown by each of the four audiometers, were averaged and plotted. Differences between the readings at most frequencies are apparent on the chart. The average difference for all frequencies is readily compiled and is not great.

#### SUMMARY

1 Four audiometers of different makes were investigated to determine their comparative performances for air conduction tests and the need for pure wave form in clinical practice.

2 Audiometer X consistently showed the highest loss of hearing, Y showed a medium but more erratic loss and Z showed the smallest loss. As compared with the 2-A audiometer the average differences were plus 5 decibels for X, minus 3 decibels for Y and minus 6 decibels for Z.

3 Audiometers X, Y and Z were capable of measuring greater losses of hearing than 2-A.

4 Plus or minus 5 decibels was found to be the combined human error factor of observer and patient.

5 An average quiet, not soundproof, room was used for the tests.

#### CONCLUSIONS

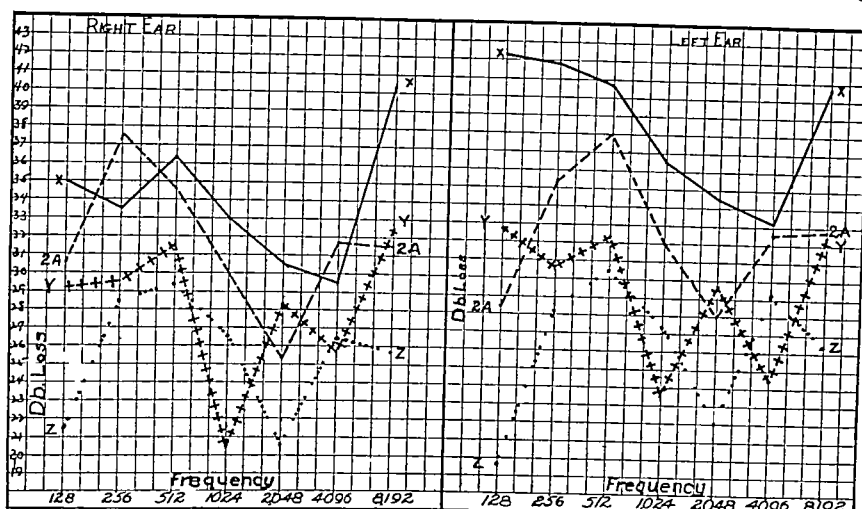
1 Audiometers, despite the foregoing variations, furnish the best means of testing hearing acuity.

2 Any one of the four tested will be more useful in clinical practice than any other means now available for testing and recording hearing acuity.

3 The lack of purity of sound wave apparently did not introduce any serious errors that were not largely explainable by other causes.

4 A quiet room is essential. The need for a soundproof room increases as the loss of hearing to be tested decreases.

5 An audiometer should be part of the office equipment of every otologist.



Curves showing the average loss of hearing of sixteen persons as measured by four different audiometers (896 observations). Y indicates the Sonotone audiometer, X the Marvel, Z the Western Electric 6-A, and 2-A the Western Electric 2-A. Intensity (loudness) is plotted vertically in decibels and frequency (pitch) horizontally at octave intervals. Tests at octave letters as well as sweeps through the conversation range (from 256 to 2048) would probably have revealed the existence of many tone islands. The figure 896 is obtained by multiplying 4 (audiometers) by 7 (frequencies) by 2 (ears) by 16 (patients). As each observation averaged a minimum of three readings the individual observations actually total more than 2,588.

cially by laboratory workers. To determine its real value in actual practice, thirty persons who were moderately hard of hearing were tested with four audiometers. Three of these, X (Sonotone), Z (Western Electric 6-A) and Western Electric 2-A, probably meet the requirements of the Council on Physical Therapy, while Y (Marvel) has an admittedly imperfect wave form. Western Electric 2-A was arbitrarily taken as a standard for comparison because of its long established (but unfortunately far from sufficient) use and the literature it has created.

The four audiometers were placed in a small inside room of an otologist's office. The doors and windows in this and the adjoining outside rooms were closed during the tests. The average noise level was then reduced from 50 to 20 decibels. A thick rubber hood around the air receiver, with a similar cup over the opposite ear, further lowered the noise level but to exactly what extent was not determined.

Audiometer X is provided with dials for octave (from 128 to 8,192) as well as sweep frequencies (from 2,500 to 17,000). Intensity is calibrated in

4 Comparisons for bone conduction will subsequently be reported.

OTOLOGIST'S COMMITTEE

Through the Otologists' Committee on Audiometers and Hearing Aids,<sup>5</sup> the Council on Physical Therapy of the American Medical Association places its facilities at the disposal of otologists for the purpose of correlating clinical experience, laboratory procedure and manufacturing detail. Acceptance by this Council should become an incentive to manufacturers to construct instruments in accordance with agreed-on clinical requirements and should assure otologists that advertised claims meet required specifications.

25 East Washington Street

## Clinical Notes, Suggestions and New Instruments

### THROMBOCYTOPENIC PURPURA FOLLOWING ALLYL ISOPROPYL ACETYL CARBAMIDE (SEDORMID)

ARTHUR M. HOFFMAN, M.D., JULIUS KAHN, M.D., AND J. P. FITZGIBBON, M.D., LOS ANGELES

The purpuric state has been classified by Leschke<sup>1</sup> and modified by Pratt<sup>2</sup> into the nonthrombocytopenic and the thrombocytopenic varieties. Of the latter, Werthof's disease or essential thrombocytopenic purpura forms the larger group with the secondary or symptomatic thrombocytopenic purpura due to x-rays, radium, leukemia, benzene and arsphenamine comprising the remainder.

The etiology of purpura being manifold, further description of apparently authentic etiologic agents is justified.

Squier and Madison's<sup>3</sup> description of three patients in whom definite thrombocytopenic purpura seemed related to food allergy is an example of this trend. Quinine sensitivity producing thrombocytopenia and purpura has been described by Maritschek and Markowicz<sup>4</sup> and by Peshkin and Miller<sup>5</sup> for quinine and ergot.

Sedormid (allyl-isopropyl-acetyl-carbamide) was first reported as suspect as an etiologic agent in thrombocytopenic purpura by Loewy<sup>6</sup> in 1934. In one patient severe purpura with thrombocytopenia could be induced at will by the administration of a one-half to one-fourth gram (0.032 to 0.016 Gm.) tablet of the drug. This patient had taken sedormid previously for almost a year without untoward manifestations. Two other milder cases are described. In 1933 Denning<sup>7</sup> reported a case in a woman with purpura and ascribed it to the ingestion of iodine, with two subsequent recurrences, each one the day following administration of sedormid. In a foreign letter to THE JOURNAL appeared a description of two cases presented by A. Vogel<sup>8</sup> to the Vienna Medical Society. Both patients had taken sedormid on occasions without untoward effect and both had had long intervals between taking the drug. On two later occasions severe purpura with marked thrombocytopenia developed.

5 This committee is composed of Drs. George M. Coate, Lee Wallace Dean, Edmund Prince Fowler, Austin A. Hayden (chairman), Isaac H. Jones, Douglas MacFarlan, Burt R. Shurly, Horace Newhart and William P. Wherry. Mr. Howard A. Carter is secretary. Several of the individual members have availed themselves of the services of such physicians as Bunch, Fletcher, Hartig, Knudsen and Rogers.

From the University of Southern California School of Medicine and the Los Angeles General Hospital.

1 Leschke E. Deutsche med. Wchnschr. 51: 1352 (Aug. 14) 1925.

2 Pratt J. H. in Osler's Modern Medicine, ed. 3 Philadelphia Lea & Febiger 5: 101, 1927.

3 Squier T. L. and Madison F. W. Thrombocytopenic Purpura Due to Food Allergy. J. Allergy 8: 143 (Jan.) 1937.

4 Maritschek M. and Markowicz H. Hypersensitivity to Quinine with Purpura Haemorrhagica. Especially in the Upper Air and Food Passages. Monatschr. f. Ohrenh. 67: 410 (April) 1913.

5 Peshkin M. M. and Miller J. A. Quinine and Ergot Allergy and Thrombocytopenic Purpura. J. A. M. A. 102: 1737 (May 26) 1934.

6 Loewy F. E. Thrombocytopenic Hemorrhagic Purpura Due to Idiosyncrasy Toward the Hypnotic Sedormid. Lancet 1: 845 (April 21) 1934.

7 Denning H. Munchen med. Wchnschr. 80: 562 (April 14) 1933.

8 Purpura Haemorrhagica Following the Use of Allyl Isopropyl Acetyl Carbamide. Vienna letter. J. A. M. A. 105: 612 (Aug. 24) 1935.

Boas and Erf<sup>9</sup> recently reported another instance of thrombocytopenic purpura following the ingestion of sedormid in a woman who had taken the drug several times a week over a period of two years. Sedormid the night before preceded two bouts of purpura and was induced in a trial administration. They report a similar picture in a woman following the use of phenobarbital, thrombocytopenia coming on four days after the development of a rather typical phenobarbital rash.

To these seven cases we add three cases observed by us as instances of thrombocytopenic purpura induced by sedormid.

#### REPORT OF CASES

CASE 1—A woman, aged 37, seen Jan. 18, 1933, had marked purpura of the mucous membranes and skin, which had appeared on awakening that morning and had been present on two previous occasions two and three months before. Physical examination was negative except for the purpuric spots. The spleen was not palpable. There was no bleeding from the mucous membranes. There was no personal or familial history of allergy. The tourniquet test was markedly positive, hemoglobin was 96 per cent, red blood cells numbered 5,350,000 and white blood cells 5,200, with 63 per cent polymorphonuclear neutrophils, 30.5 per cent lymphocytes, 6 per cent mononuclear cells and 0.5 per cent eosinophilic polymorphonuclear leukocytes, the platelet count was 55,000 per cubic millimeter. Bleeding time was five minutes (Duke's method) and coagulation time thirty-two minutes (Howell's method). There was no clot retraction after forty-eight hours.

The patient advanced the information that she had taken one sedormid tablet the night before each of the three attacks and on about four or five occasions over a period of several months.



Hemorrhagic areas on buttocks in case 2

prior to the first attack. The purpuric manifestations disappeared within five to six days after observation, with a return to normal of the blood platelets and clot retraction. She refused any further trial with the drug and when last seen (1937) had had no recurrence of purpuric manifestations.

CASE 2—A white woman, aged 37, admitted to the Los Angeles General Hospital April 10, 1937, because of purpura, which had occurred the morning of admission, had had excellent health in the past except for a nervous breakdown at the age of 27. The morning of admission to the hospital she had awakened to find herself covered with purplish spots of varying size on nearly every part of the body. Her physician saw her at once and sent her to the hospital.

The purpuric spots were most numerous over both ankles and chiefly pea sized, but there were larger spots on the thighs, trunk and arms. Physical examination was negative except for these manifestations and some bleeding of the gums, with a 2 cm. hemorrhagic area on the pharyngeal wall. The blood pressure was 130 systolic, 96 diastolic. The spleen was not felt and there was no adenopathy present.

The patient had suffered no trauma. She had a normal menstrual history and was not menstruating on her admission to the hospital. She did not mention any drug therapy.

The Wassermann reaction was negative. The urine had a specific gravity of 1.020 and contained only a few red blood cells. Examination of the blood showed 4,760,000 red blood cells, hemoglobin 80 per cent and white blood cells 9,100 with 76 per cent polymorphonuclears and 24 per cent lymphocytes. The next day the hemoglobin was 90 per cent, red cells 4,570,000,

9 Boas E. P. and Erf L. A. Thrombocytopenic Purpura Following Medication with Sedormid and with Phenobarbital. New York State J. Med. 36: 491 (April 1) 1936.

platelets 152,000, bleeding time five and one-half minutes, clotting time nine minutes and white blood cells 9,350 with 55.5 per cent polymorphonuclears, 32.5 per cent lymphocytes, 7 per cent monocytes, 0.4 per cent eosinophils and 1 per cent basophils. There was moderate toxic granulation with some shift to the left. The red blood cells appeared normal. Blood calcium was 9 mg per hundred cubic centimeters of blood, total nonprotein

Blood Counts in Case 3

Date	Hemoglobin per Cent	Erythrocytes	Leukocytes	Polymorphonuclears per Cent	Lymphocytes per Cent	Large Mononuclears and Transferrins per Cent	Eosinophils per Cent	Basophils, per Cent	Platelets
Sedormid 4 grains 5/4/37									
5/10/37	98	4 920 000	9 160	71	22	5	2	0	40 360
5/14/37	99	5 110 000	6 700	65	28.5	6	0.5	0	138 000
5/20/37	90	4 970 000	7 300	68	22.5	8.5	0.5	0.5	239 000
Sedormid 4 grains on retiring 5/20/37									
5/21/37	90	4 640 000	5 900	67.5	24	6.5	1.5	0.5	37 000
5/25/37									185 000
Reinstitution of bismarsen therapy									
6/ 2/37	90	4 810 000	6 900	65.5	24.5	7	2.5	0.5	498 000
6/ 4/37		4 850 000							397 000

No abnormal cells were noted on any of the counts

nitrogen 20 mg per hundred cubic centimeters. The patient had a temperature of 99.6 F for several days and a mean pulse of 90. The stools were tarry and the benzidine test was strongly positive. The tourniquet test was markedly positive.

One week after admission, when the purpuric spots had practically faded and when she was generally improved, she was asked if she had ever taken sedormid. She replied that she had taken one-half tablet (2 grains, or 0.13 Gm) the night before admission, but she didn't think it had anything to do with her illness. She further stated that she had taken an occasional tablet of the drug from time to time during the past three years. She felt that she had probably taken three full boxes of ten tablets each. She had not taken the drug for several weeks until the night before admission to the hospital.

In an endeavor to test the relation of the drug to her purpura she was given one tablet (4 grains, or 0.25 Gm) on the night of April 20. A complete blood examination was ordered that day and unfortunately not performed. At 4 o'clock the next morning she was awakened by pain in the buttocks and she discovered two large purpuric spots there. By morning she had fresh showers of spots, larger on the average than those on admission, in the same general distribution. There was also a large painful spot on the right side of the tongue. The accompanying illustration shows the marked hemorrhagic areas on the buttocks. A platelet count done in the morning was 59,000. Three days later, with beginning fading of the purpura, the platelets numbered 91,000. A vitamin C estimation on a twenty-four hour urine showed an excretion of 66 mg of vitamin C.

At this time the patient felt that she was being experimented on and left the hospital.

CASE 3—A white man, aged 56, a traveling salesman, first seen in October 1935, was found by one of us (J. K.) to have a duodenal ulcer, clinically and radiologically distinctive, and tabes dorsalis with positive serologic reactions in both blood and spinal fluid. The blood count and urine were normal. In the past he had never had any purpuric tendency. His family history was negative. An appendectomy had been performed in 1917.

During 1935 and 1936 the patient had been given irregular antisyphilitic treatment and late in 1936 a series of intravenous typhoid injections for a severe arthritis. Since November 1935 from time to time, he had taken sedormid for sleeplessness.

During March and April 1937 the patient received intramuscular injections of 0.2 Gm of bismarsen (bismuth arsprenamine sulfonate), the last dose on April 8. Four grains (0.25 Gm) of sedormid was taken on retiring May 2 and May 4. During

the night of May 8, purpura, manifested by bleeding from the gums and hemorrhagic vesicles on the tongue, buccal mucosa membranes and skin, with scattered skin petechiae, became apparent. There was no fever and no other pertinent physical manifestation. The platelet count was 40,000.

On the night of May 20, the purpura having disappeared the blood count being normal and the platelets up to 239,000 in order to determine which of his medicines, if any, had caused the purpura, another 4 grains of sedormid was given. Promptly during the night a repetition of the previous purpuric episode commenced, again with vesicular lesions, bleeding from the gums and skin petechiae, and again accompanied by a thrombocytopenia.

Reinstitution of bismarsen injections in doses of 0.2 Gm intramuscularly May 25, June 4 and 11 was unattended by any sign of purpura or change in the blood picture.

## COMMENT

The widespread use of sedormid without development of purpura at once raises the question of the character of the individual susceptibility to the drug. The problem is similar to the relationship of aminopyrine and dimethylenol to the production of neutropenia. Here the benzamide radical seems to affect bone marrow with arrest of maturation of neutrophils. The carbamide radical of sedormid is under suspicion as the active agent in the production of thrombocytopenia, but the manner in which it acts is unknown. In all cases reported, including our three, the patient had taken the drug over many months without untoward effect. All likewise had had a short interval of freedom from ingestion of the drug before taking the one dose that immediately preceded the purpura. This suggests the development of an allergic sensitivity.

1136 West Sixth Street

## THROMBOCYTOPENIC PURPURA FOLLOWING USE OF ALLYL ISOPROPYL ACETYL-CARBAMIDE (SEDORMID)

A. M. MOODY, M.D., SAN FRANCISCO

This brief report is made to record an unusual case of thrombocytopenic purpura which occurred following the taking of relatively small doses of a so-called harmless hypnotic, Sedormid-Roche (allyl-isopropyl-acetyl carbamide).

A woman, aged 60, with mild diabetes, while vacationing during the summer of 1936 was advised by friends to take "Sedormid" tablets to obtain some restful sleep. Following this advice two tablets of 4 grains (0.26 Gm) each were taken on one occasion. There were no ill effects noted. She had no occasion to take any more hypnotics until Feb. 6, 1937, when two 4 grain tablets were taken for sleeplessness. A similar dose was repeated February 9.

At 1 p.m. February 10 the patient noticed that her tongue felt quite thick, she looked at it in the mirror and noted several dark purple areas about one-fourth inch in diameter. The next morning (February 11) she saw many more on the tongue as well as large purple blotches on the skin. These areas were not painful. Brownish red blood was noted in the stool. She called her physician, who ordered her to go to the hospital.

The patient entered the St. Francis Hospital at 3 p.m. February 11, under the care of her personal physician, Dr. Harold Fraser, who has permitted me to report this case.

She walked into the hospital, was put to bed and laboratory examinations were made. At this time her temperature was 97 F, pulse 96, respiration rate 22. Her skin contained petechial and ecchymotic hemorrhages disseminated throughout, and there were many hemorrhages of the tongue and buccal mucosa. Examination of the blood revealed red blood cells 3,700,000, hemoglobin 64.1 per cent (93 Gm), leukocytes 10,700 with 72 per cent neutrophils, coagulation time four minutes, bleeding time thirty-five minutes, only an occasional platelet could be found. Thrombocytopenic purpura was diagnosed.

The patient was given 0.4 cc of moccasin snake venom at 7 p.m. and then daily doses of 1 cc each were given for the next few days. February 15 she received a transfusion of 500 cc. of whole blood. The bleeding time was down to eight minutes February 12 and down to three minutes February 14.

From the laboratory of the St. Francis Hospital

On admission the urine contained only a few red cells, a trace of albumin, 0.5 per cent sugar and occasional hyaline casts.

The stools contained macroscopic blood until February 14. There were clots of blood in the stool passed at 1:30 a. m. on the 13th.

The patient continued to become weaker for the next few days, although no fresh hemorrhages were seen after twenty-four hours in the hospital. During the night of February 14 she was very restless and mentally confused. On the morning of February 15 the blood count was red blood cells 1,900,000, hemoglobin 32.7 per cent, coagulation time seven minutes, bleeding time 3 minutes and platelets 54,800. Following the transfusion given on this date the patient continued to improve and left the hospital March 1 in excellent condition.

In searching for a cause of the purpura the possibility of sedormid arose, and references to a few similar instances were found. Loewy<sup>1</sup> reported three cases. One of these patients submitted to several tests which proved conclusively a relationship between the drug and the thrombocytopenia. He states "Severe loss of blood platelets and consequent hemorrhagic diathesis have been caused by the usual doses of Sedormid in certain hypersensitive patients who have received the drug for several months previously and with apparently good results." He suggests the possibility of an allergotoxic effect. Boas and Erf<sup>2</sup> reported in 1936 two cases of purpura, one each following medication with Sedormid and phenobarbital.

February 14, Dr. H. C. Davis consulted me with regard to causes of purpura and it was found that his patient had been taking Sedormid. The patient, a woman, aged 45, passing through the menopause, had taken Sedormid-Roche over a period of two weeks, from one to four tablets a day, in doses of one or two tablets at a time. During that period she had taken two boxes, a total of twenty tablets. When first seen, February 14, the patient had hemorrhages in the gums, both upper and lower, and on the right side of the mouth. February 15 the gums on both sides were hemorrhagic, there were two blood blisters near the tip of the tongue and a third starting on the right side of the tongue. There were two ecchymotic spots on the inner side of the lower lip. Around each wrist were isolated and confluent hemorrhagic areas with one or two on the dorsum of the second finger of the left hand. She had a nosebleed the same morning. At the end of five days all hemorrhages stopped. There was no blood in the urine or

festations of idiosyncrasy and overdosage of the newer compounds, but there is no reason to believe that they differ markedly from those of barbitol and phenobarbital. In fact most of the toxic signs and symptoms described in connection with earlier compounds have been experienced with those more recently introduced. Not infrequently the hypnotics lead to skin eruptions, especially when used for some time. They assume various forms, the most common being of the erythema order, but among others urticaria, purpura, papular eruptions and blisters occur."

900 Hyde Street

## Special Article

### THE CHEMISTRY OF THIAMIN (VITAMIN B<sub>1</sub>)

ROBERT R. WILLIAMS, M.S., D.Sc.

NEW YORK

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed.*

A few years ago there appeared to be a hopeless conflict among the more or less empirical observations of the host of workers in the field of vitamin B. Fortunately the converging events since 1935 have established the chemical structure and certain properties of vitamin B<sub>1</sub> in a firm fashion. In order to emphasize that this factor is a definite chemical entity, distinct from all other substances, it may be well to use a distinctive name. For years the term antineuritic or antiberiberi vitamin had been used to designate this substance, but such names contain implications contrary to fact or beyond our knowledge, for example, that the relationship between neuritis and beriberi and this vitamin is mutually exclusive. In addition the name "vitamin" is subject to the objection that it brings under a common designation a group of substances which are chemically wholly unrelated to the best of our knowledge.

Prof. B. C. P. Jansen of Amsterdam, who, with W. F. Donath, first isolated the substance from natural sources in 1926,<sup>1</sup> suggested the name aneurin<sup>2</sup> for vitamin B<sub>1</sub>. As a well deserved mark of respect for Professor Jansen, this name has come into extensive use in England and continental Europe. However, the name has been objected to on the ground of therapeutic implication and also because of its resemblance to the term aneurysm, which has long been used for a totally unrelated phenomenon. The latter objection seems to me more cogent. As to the former, a therapeutic implication, if based on genuine scientific information, has at least the merit of a memory aid. Many physicians must become confused by the arbitrary letters A, B, C and so on for the vitamins. In an endeavor to promote the adoption of a universally acceptable term, based on the chemistry of the substance, I have proposed "thiamin" (chloride, bromide, sulfate and so on) pending action of the Conference on Vitamin Standardization.

#### Blood Examinations

Date	Red Blood Cells per Cu. Mm.	Hemo- globin per Cent	Hemo- globin Gm. per Cent	White Blood Cells per Cu. Mm.	Polv. morpho- nuclears per Cent	Coag- ula- tion Time, Min.	Bleed- ing Time Min.	Platelets
2/11/37	3,760,000	64.1	9.8	10,700	72	4	35	Rare
2/12/37				7,600	70	5	8	16,348
2/14/37	2,140,000	40.9	5.93	10,500	59	8	3	45,570
2/15/37	1,970,000	22.7	5.5	7,500	59	7	3	54,807
2/16/37	2,900,000	55.7	8.0	8,100	55	6½	2½	23,200
2/17/37	3,200,000	58.9	8.5	10,500	70	5	2	96,470
2/19/37	3,090,000	60.5	8.73	10,400	59	4	2	154,500
2/20/37	3,260,000	62.8	9.0	10,700	46	4½	2	163,000
2/22/37	3,010,000	55.7	8.0	7,500	42	6	2	77,179
2/24/37	3,550,000	62.8	9.0	7,300	66			226,600
2/26/37	3,870,000	71.1	10.2	10,200	58			203,684
3/1/37	3,780,000	71.1	10.2	9,000	72			378,000

Wassermann and Kahn reactions negative

stools, according to the patient, who refused to have any examinations other than those which her physician could determine by inspection.

#### COMMENT

There are probably many more instances of these supposedly rare toxic reactions following the indiscriminate use of hypnotics, such as are herein reported, than the literature would lead one to believe. Physicians should accept a word of warning against these dangers.

The following statements from Cushny's Pharmacology<sup>3</sup> are important: "Much is still to be learned concerning the mani-

<sup>1</sup> Loewy, F. E. *Lancet* **1**, 845 (April 21) 1934.  
<sup>2</sup> Boas, E. P. and Erf, L. A. *New York State J. Med.* **36**, 491 (April 1) 1936.

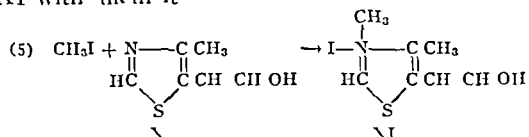
<sup>3</sup> Edmunds and Gunn. *Cushny's Pharmacology and Therapeutics*. Philadelphia: Lea & Febiger, 1936, pp. 367 and 365.

<sup>1</sup> Jansen, B. C. P. and Donath, W. F. *Mededeel. Dienst Volksgesondheid Nederland Indie* 1926, part 1, p. 186.  
<sup>2</sup> Jansen, B. C. P. *Nature* **135**, 267, 1935.

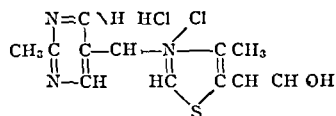


taking place not instantly as ionic reactions do but relatively slowly. Furthermore, this department continued until a total of 3 moles of alkali had been added. Only then was there a marked and steady rise in alkalinity. The excessive proportion of alkali required was wholly unexpected at the time, as thiamin was known to contain only 2 acid radicals.

It was found possible to add methyl iodide to X to form XI.<sup>9</sup> Such an addition of methyl iodide is a very general property of tertiary nitrogenous bases and was therefore to be expected in this case. On titration of XI with alkali it

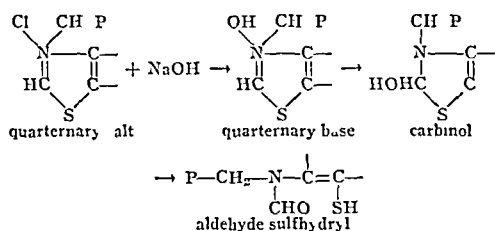


showed the same peculiar behavior as thiamin, thus pointing to a fundamental kinship which could be accounted for only by assigning to thiamin the following structure, XII.<sup>6</sup>



XII Thiamin chloride hydrochloride

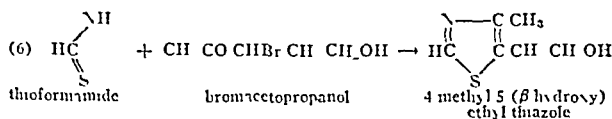
The peculiar behavior of these quaternary thiazole salts with alkali is due not to a single rearrangement but to two successive rearrangements of the thiazole portion of the molecule.<sup>14</sup>



in which P represents in the case of thiamin the pyrimidine nucleus and its substituent groups. The final mole of alkali is required to neutralize the acidic —SH group which is formed when the thiazole ring opens. On addition of acid the series of steps is reversed and the quaternary thiazole, e. g., thiamin, is recovered unchanged. This behavior as well as the sulfite cleavage is an outstanding peculiarity of the unique thiamin molecule. Nature evidently has chosen some aristocratic molecules for the performance of certain of her distinctive biochemical tasks.

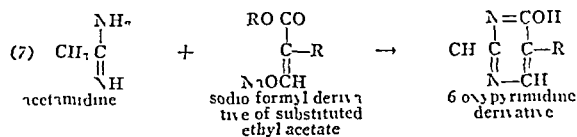
#### SYNTHESIS OF THIAMIN

The first step in the synthesis of thiamin was the reproduction of the thiazole portion. This was first done by my associate Dr. E. R. Buchman<sup>15</sup> by the simple reaction

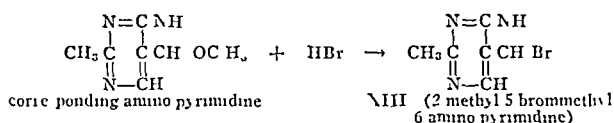
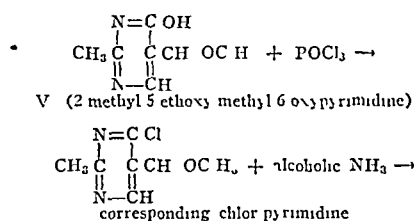


Other syntheses of the same compound also have been achieved.<sup>12</sup>

The synthesis of the pyrimidine portion was accomplished by methods similar to those employed for the production of pyrimidines IV, V and VI, previously discussed in connection with the establishment of structure. The general method is as follows.<sup>16</sup>

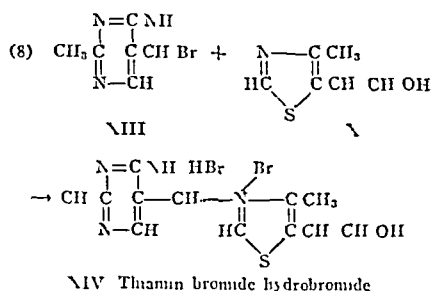


If in the foregoing sodioformyl derivative R represents CH<sub>3</sub>, the pyrimidine obtained is 2, 5-dimethyl-6-oxypyrimidine, if R represents CH<sub>2</sub>OC<sub>2</sub>H<sub>5</sub> the resulting pyrimidine is V (equation 4). For the synthesis of thiamin itself, product V is converted into a bromamino derivative, thus



The last of this series of steps is somewhat analogous to that of equation 4. The purpose of putting the Br in the side chain in position 5 instead of the sulfonic group is that the brom compound XIII is very reactive while the corresponding sulfonic compound VII is extremely unreactive. My associate Dr. J. K. Cline was in large measure responsible for the success of these pyrimidine syntheses and the final condensation.

The final step in the synthesis of thiamin is to heat the hydrobromide of the bromopyrimidine, XIII, with the thiazole, X. This results in combination of the two molecules to form thiamin bromide hydrobromide quite analogous to the reaction shown in equation 5.



The bromide hydrobromide, XIV, is readily converted into the chloride hydrochloride XII, simply by shaking a solution of the former with silver chloride. The resulting substance is chemically identical<sup>17</sup> with the thiamin chloride previously obtained from nature. The correspondence of the ultraviolet absorption spectrums of the two synthetic salts with that from nature

<sup>14</sup> Mills, W. H., Clark, I. M. and Achermann, J. A. J. Chem. Soc. **123**, 2353 (1933).

<sup>15</sup> Buchman, E. R. Studies of Crystalline Vitamin B<sub>1</sub>. XIV. Sulfite Cleavage. IV. The Thiazole Half. J. Am. Chem. Soc. **55**, 1803 (Sept.) 1933.

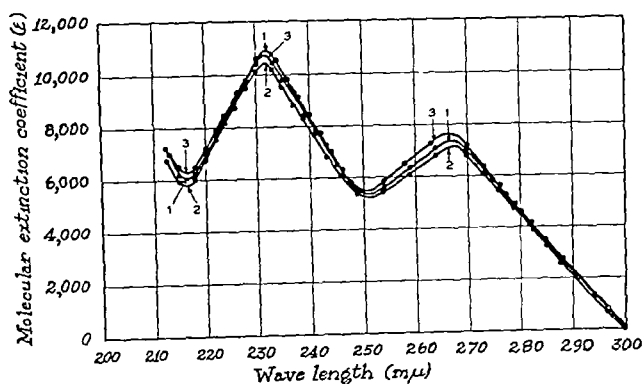
<sup>16</sup> Williams, R. P. and Cline, J. K. Synthesis of Vitamin B<sub>1</sub>. J. Am. Chem. Soc. **55**, 1504 (Aug.) 1933.

<sup>17</sup> Williams, R. P. and Cline, J. K. Synthetic Vitamin B<sub>1</sub>. J. Am. Chem. Soc. **59**, 216 (Jan.) 1937.



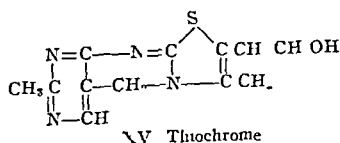
is shown in the accompanying chart Its physiologic action is also identical<sup>18</sup>

Another synthesis of thiamin by Andersag and Westphal has been announced by Grewe<sup>19</sup> but has not been fully described Still another synthesis is given by Todd and Bergel<sup>20</sup> All syntheses agree as to the structure This structure of thiamin is also confirmed by establishment of the structure of thiochrome, a fluorescent coloring matter first isolated from yeast,<sup>21</sup> later obtained by the oxidation of thiamin<sup>22</sup> and finally synthesized directly by Todd, Bergel and Jacob<sup>23</sup> Thiochrome has the structure XV It is possible that thiochrome plays a role as an intermediate in the func-



A comparison of the ultraviolet absorptions of the natural and synthetic products: curve 1 natural vitamin (hydrochloride) curve 2 synthetic vitamin (hydrochloride) curve 3, synthetic vitamin (hydrobromide)

tioning of thiamin in tissues I tentatively prefer the view that thiochrome is merely a natural degradation product of thiamin which has already passed the useful stage It is inactive



#### BIOCHEMISTRY OF THIAMIN

The reactions of thiamin are important particularly for three reasons (1) They may result in loss of the natural supply by improper methods of distributing and preparing foods, (2) they may serve as a basis for the devising of adequate chemical methods of assaying foods, concentrates and body secretions, (3) they are of interest for the interpretation of the mode of functioning of the substance in living tissues

Under the first head the most important consideration is the lability of thiamin in neutral mediums This lability is well exemplified by the ease of cleavage by sulfite at  $pH$  5 to 6 This cleavage is not peculiar to solutions containing sulfite Barium nitrite or sodium acetate effects splitting in a similar sense and it seems probable that in neutral foods free thiamin is very subject to corresponding splitting under influences which are as yet imperfectly understood At

high acidity this type of cleavage of thiamin does not occur Probably other constituents of tissues and fluids often participate in destructive reactions when the medium is neutral Since thiamin is never present in more than a few parts per million, other constituents are in general present in overwhelming proportion

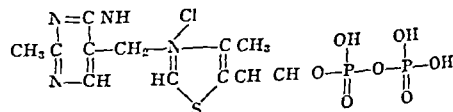
In spite of this fact, loss of  $B_1$  activity in cooking of foods is sometimes negligibly small Quite possible the stability of thiamin in foods is to a great extent due to its existence in combined form, e g, the pyrophosphoric ester, which will be discussed later Loss by leaching during cooking is probably more serious than by heat destruction though the latter is also substantial if cooking is prolonged for hours or is carried out at temperatures above 100 C, especially if the reaction of the foodstuff is not markedly acid. We have yet much to learn on this subject but cannot progress greatly till better methods of assay are available

The effect of heat on thiamin is serious only in neutral or alkaline solutions Probably heat merely aggravates the splitting tendency Solutions of pure thiamin chloride hydrochloride may be sterilized without loss by heating to 120 C for a half hour or more This stability is due to the acidity of this salt, which gives solutions of approximately  $pH$  3.5

The oxidation of thiamin to thiochrome has already been mentioned The importance or extent of this reaction in the foods or in the body is quite unknown Reduction of thiamin has also been studied by Lipmann<sup>25</sup> and is rather suggestive of a possible mode of functioning of thiamin in living things Reduction of thiamin with platinum black results in the addition of two hydrogen atoms, reduction with hydrosulfite adds one hydrogen and produces a mole of acid A similar contrast in the behavior of these two reducing agents is found in their action on a dehydrogenating cofactor isolated from red blood cells by Warburg and his co-workers<sup>26</sup> This suggests a possible dehydrogenase function of thiamin

#### BIOCHEMICAL LESION IN THIAMIN DEFICIENCY

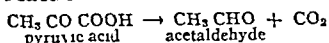
A more tangible and better defined relationship of thiamin to an enzyme is found in the work of Lohmann and Schuster,<sup>27</sup> who isolated from yeast a crystalline derivative of thiamin having the structure



It is the pyrophosphoric ester of thiamin This substance is split also by sulfite to form the same products which thiamin yields, except that the thiazole is obtained in pyrophosphorylated form rather than free The ester is antineuritic, though less so than thiamin It also functions as a cocarboxylase with a protein or proteins present in washed yeast cells and in such an enzyme system strongly promotes the evolution of carbon dioxide from a pyruvate-phosphate medium in which the cells are suspended, a property which is lost

18 Eckler C R and Chen K K. Action of Synthetic Vitamin  $B_1$ . Proc Soc. Exper Biol & Med 35 458 (May) 1937  
19 Grewe Rudolf. Ueber das antineuritische Vitamin. Ztschr f physiol Chem 242 89 (Aug 3) 1936  
20 Todd A R and Bergel F. J Chem Soc March 1937 p 564  
21 Kuhn R Rudy H and Wagner Jauregg T. Ber Deutsche chem Gesellsch 66 1930 1933  
22 Barger G Barger I and Todd A R. Nature 136 259 1935  
23 Todd A R Bergel F and Jacob A. J Chem Soc 1936  
24 Molitor H and Sampson W L. F. Merck Jahrebericht 1935  
25 Lipmann Fritz. Hydrogenation of Vitamin  $B_1$ . Nature 1097 (Dec 26) 1936  
26 Warburg Otto Christian Walter and Griese Alfred. V. stoffubertagendes Co-Ferment seine Zusammensetzung und Wirkung. Biochem Ztschr 282 157 (Nov 21) 1935  
27 Lohmann K. and Schuster P. Naturwissenschaften 23 50 (Jan 8) 1937  
28 Lohmann K. Ztschr f angew Chem 50 (March) 1937

ing in free thiamin. The cocarboxylase is thought to promote the reaction



The cocarboxylase is oxidized with alkaline ferricyanide to a thiochrome-like substance. One phosphoric acid group is readily hydrolysed off, the second with difficulty.

The cocarboxylase also has the property of promoting oxygen uptake in vitro of slices of polyneuritic brain tissue in a pyruvate medium, a property previously shown by Peters to be characteristic of pure thiamin. The work of Peters and his associates on this subject is contained in a large number of papers, but since the ideas of the authors have undergone a number of changes the reader will do well to refer first to the latest papers.<sup>28</sup> Those in *Current Science* and the *Lancet* are summaries. The principal finding is that as polyneuritis develops in pigeons the brain tissue loses its power to respire and pyruvic acid accumulates in it. Administration of thiamin corrects these faults in the animal. It also destroys pyruvic acid and promotes respiration of the tissue in vitro. Pyruvic acid is regarded as a normal intermediary in carbohydrate metabolism, which is not properly disposed of in the polyneuritic state. This abnormality is not wholly confined to the brain tissue but is present to some extent in the kidney and heart muscle.

Recently a paper by Westenbrink and Pollak<sup>29</sup> has brought Peters' older observations into even closer relationship with the later ones of Lohmann and Schuster. This paper confirms the tissue respiration work of Peters and his associates and adds the interesting observation that there is a ten minute induction period before oxygen uptake begins after the addition of thiamin to a medium containing polyneuritic brain tissue. Westenbrink and Pollak postulate the necessity of thiamin combining with something else before it begins to function. Had they seen Lohmann and Schuster's work before publishing their results they doubtless would have been tempted to assume pyrophosphorylation as the necessary intermediate step.

All these results relating thiamin to the disposal of accumulated pyruvic acid in polyneuritic tissues is of tremendous interest in view of the finding by Platt and Lu<sup>30</sup> of considerable quantities of pyruvic acid in the blood of patients with beriberi. Indeed, it seems almost certain that the disposal of pyruvic acid by an enzymic decarboxylation is one of the functions of thiamin. Thiamin in pyrophosphorylated form may well constitute the prosthetic group of this enzyme just as riboflavin, B<sub>2</sub>, in phosphorylated form constitutes the prosthetic group of a dehydrogenating enzyme.<sup>31</sup>

However, many points remain to be cleared up before it can be said that this is the sole or even principal function of thiamin. Particularly it is not yet clear precisely how promotion of oxygen uptake is related to decarboxylation. In addition there is an extensive literature which attempts to associate methyl glyoxal (pyruvic aldehyde) rather than pyruvic acid with the beriberic condition. Peters found no methyl glyoxal in polyneuritic brain tissue of pigeons,<sup>32</sup> but it has

been reported by others in the urine of B<sub>1</sub> deficient infants,<sup>33</sup> of B<sub>1</sub> deficient rats<sup>34</sup> and in liver extracts of B<sub>1</sub> deficient animals.<sup>35</sup> Moreover, there is an extended series of voluminous articles of Japanese origin chiefly in the *Tohoku Journal of Experimental Medicine* during the past fifteen years which greatly emphasize the occurrence in the milk of mothers with beriberi of a methyl glyoxal-like substance and also a deficiency of a normal peroxidase in the milk and blood leukocytes. The Japanese authors emphasize the toxic character of this milk. Mice on a polished rice diet die in from one to five days if injected daily with milk from mothers with beriberi or rabbits with polyneuritis, while normal milk has no effect.<sup>36</sup> In women, one breast may secrete toxic milk, the other nontoxic.<sup>37</sup> There are from seventy-five to eighty papers along these lines in this one journal during the past fifteen years. They deserve careful study but have been generally neglected. One of the most impressive papers is by Chiba,<sup>38</sup> as it gives detailed data on many scores of human beriberi cases.

The function of thiamin is probably not merely to get rid of pyruvic acid but to utilize it in some metabolic process. Thiamin has been shown to play a fundamental role in the physiologic economy of plants. It promotes alcoholic fermentation by yeast,<sup>39</sup> it is essential to growth of excised embryos of seeds influencing root production profoundly.<sup>40</sup> According to the results of W. J. Robbins, Mary H. Bartley, A. G. Hogan and others,<sup>41</sup> plants and, to some extent, animals have a capacity for synthesizing thiamin if supplied with the intermediates used in its artificial synthesis. Thiamin functions in the economy of a wide variety of micro-organisms, in the lower and higher plants, and in insects as well as in all higher animals. One can scarcely regard it otherwise than as one of nature's earlier and more fundamental inventions in the process of evolving life. It is difficult to believe that its action in the higher forms of life is restricted to specialized tissues or to a narrow function.

#### METHODS OF ASSAY AND DISTRIBUTION IN FOODS

The existing methods of assay are wholly biologic in nature and are not entirely satisfactory. The method most widely used for testing foods is the rat growth method. It gives fairly consistent results but cannot be highly specific as it involves the unwarranted assumption that there are no thermolabile vitamins in yeast or in foods generally other than thiamin. The rat curative method<sup>42</sup> is more specific but it has not been developed or even tried extensively for food testing purposes. Also the international standard of

33 Geiger A and Rosenberg A. Methylglyoxal im Harn und in der Cerebrospinalflüssigkeit bei Ernährungsstörungen der Säuglinge mit toxischen Symptomen und bei der experimentellen B<sub>1</sub>-Avitaminose bei Hunden und Ratten. *Klin. Wchnschr.* 12: 1258 (Aug. 12) 1933.

34 Lehmann Jörgen. Ist das Vorkommen von Methylglyoxal im Harn Spezifisch für B<sub>1</sub>-Avitaminose? *Skandinav. Arch. f. Physiol.* 71: 157 (Feb.) 1935.

35 Vogt-Müller J. Ist Avitaminosis B<sub>1</sub> eine Intoxikation mit Methylglyoxal? *Biochem. Ztschr.* 233: 248 (April 22) 1931.

36 Asakura Kyumatsu and Ohsako Hujio. Arakawa's Reaction and Toxicity of Human Milk. *Tohoku J. Exper. Med.* 20: 429 (March) 1933.

37 Asakura Kyumatsu. Relation Between Arakawa's Reaction and Suitability of Human Milk. *Tohoku J. Exper. Med.* 19: 275 (Aug.) 1932.

38 Chiba Marie. Prolongation of Short-Timed Peroxidase Reaction of Leucocytes as a Sign of Avitaminosis B and Effect of Vitamin B on It. *A Clinical Experiment Tohoku J. Exper. Med.* 19: 486 (Sept.) 1932.

39 Schultz Alfred, Atkin Lawrence and Frey C. N. A Fermentation Test for Vitamin B<sub>1</sub>. *J. Am. Chem. Soc.* 55: 948 (May) 1937.

40 Kogl Fritz and Haagen-Smit A. J. Biotin and Aneurin als Phytohormone. *Ztschr. f. physiol. Chem.* 243: 209 (Oct. 14) 1936. Bonner James. Vitamin B<sub>1</sub> a Growth Factor for Higher Plants. *Science* 85: 183 (Feb. 12) 1937. Robbins W. J. and Bartley M. H. Vitamin B<sub>1</sub> and the Growth of Excised Tomato Roots. *Science* 85: 246 (March 5) 1937.

41 Robbins W. J., Bartley Mary A., Hogan A. G. and Richard on J. R. Pyrimidine and Thiazole Intermediates as Substrates for Vitamin B<sub>1</sub>. *Proc. Nat. Acad. Sc.* 23: 368 (July) 1937.

42 Smith M. I. *Pub. Health Rep.* 45: 116 (Jan. 17) 1930.

28 Peters R. A. Pyruvic Acid Oxidation in Brain. I. Vitamin B<sub>1</sub> and the Pyruvate Oxidase in Pigeon's Brain. *Biochem. J.* 30: 2206 (Dec.) 1936. *Lancet* 1: 1161 (May 23) 1936. *Current Science* 5: 207 1936.

29 Westenbrink H. G. K. and Pollak J. J. *Rec. trav. chim. Pays Bas.* 56: 315 1937.

30 Platt B. S. and Lu G. D. Chemical and Clinical Findings in Beriberi with Special Reference to Vitamin B<sub>1</sub> Deficiency. *Quart. J. Med.* 5: 355 (July) 1936.

31 Tauber Henry. *Enzyme Chemistry*. New York: John Wiley & Sons, Inc. 1937.

32 Peters R. A. *Current Science* 5: 207 1936.

reference is an acid clay adsorbate which, because of the firm combination of thiamin with the clay, may not yield its thiamin fully in animal assays,<sup>43</sup> the availability varying according to the condition of the animals. This has led to endless confusion.

It will be no easy matter to devise a satisfactory method of chemical assay for thiamin in foods. It occurs in the proportions of only from 0.1 to 4 parts per million, roughly a thousand times less abundant than vitamin C. It possesses no known physical property which is adapted to delicate testing. Jansen<sup>44</sup> has proposed to convert it to thiochrome, which can be estimated optically, but a quantitative conversion has not yet been achieved. A more promising lead is that of McCollum and Piehluda,<sup>45</sup> who couple it with diazotized para-amino-acetophenone to form a red dye which may be estimated colorimetrically. An efficient method of extracting the vitamin from foods will be necessary for the application of such assay methods.

#### DIAGNOSTIC TESTS

It has been proposed to assay the urine as a diagnostic test of thiamin deficiency in patients, and some evidence of success has been cited.<sup>46</sup> My experience with this method has been limited to a single individual with severe diabetes. In this instance the patient was receiving 40 mg of thiamin daily, of which no more than 1 mg appeared in the urine in a day. The tests were repeated three times at intervals of several days while the daily dosage was continuously maintained. In view of this experience two years ago, I believe that many data will be necessary to establish suitable norms for diagnostic purposes, even though it is found that there is prevalingly a fixed ratio between ingested thiamin and that excreted in the urine. It may well be that there is a variable destruction in the body or elimination in the feces.

The therapeutic response to thiamin remains the most trustworthy diagnostic test which we have. It is quite safe, as doses of as high as 90 mg have evidenced no pharmacologic effect in human subjects.<sup>47</sup> Rats have received as high as 5 mg daily throughout life for three successive generations without adverse effects. This corresponds on a weight basis to about 1 Gm daily for the human adult. Doses of from 2 to 10 mg daily for several weeks are therefore extremely conservative for human treatment. The daily intake in food for human adults is of the order of 1 to 2 mg, the requirement is proportional to the food intake and particularly to the carbohydrate intake.

The diagnostic value of thiamin therapy is largely lost if crude natural preparations are used both because of the uncertainty of their standardization and of the presence of other vitamins which may be responsible for the observed effects. After demonstrating a B<sub>1</sub> deficiency and rectifying the immediate shortage, the physician should endeavor to direct the diet of the patient toward a more adequate supply of the vitamin. In the long run we should look to the grocery store rather than the drug store for a normal intake.

<sup>43</sup> Sampson W. L. and Kerezy J. C. *Proc. Soc. Exper. Biol. & Med.* **36** 30 (Feb.) 1937.

<sup>44</sup> Janen B. C. P. *Rec. tra. chim. Pays Bas* **55** 1046 1936.

<sup>45</sup> Prebluda H. P. and McCollum E. V. *A Chemical Reagent for the Detection and Estimation of Vitamin B<sub>1</sub>* *Science* **84** 488 (Nov. 27) 1936.

<sup>46</sup> Harris L. J. and Leong P. C. *Vitamins in Human Nutrition* *The Excretion of Vitamin B<sub>1</sub> in Human Urine and Its Dependence on the Dietary Intake* *Lancet* **1** 886 (April 18) 1936. Helmer O. W. *Vitamin B<sub>1</sub> and B<sub>2</sub> Content of Human Urine* *Proc. Soc. Exper. Biol. & Med.* **32** 1187 (April) 1935. Roscoe Margaret H. *The B<sub>1</sub> Vitamins* *Med.* **32** 1187 (April) 1935. *30* 1053 (June) 1936.

<sup>47</sup> Vorhaus M. G. Williams R. R. and Waterman R. F. *Studies on the Urinary Excretion of Vitamin B<sub>1</sub> in Patients with Diabetes* *Am. J. Digest. Dis. & Nutrition* **2** 341 (Nov.) 1935.

## Therapeutics

### THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, MD  
CHICAGO

NOTE—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed the series will be published in book form.—Ed.

#### THE THERAPY OF ICTERUS (JAUNDICE)

IN COLLABORATION WITH DR. FREDERICK STEIGMANN

Icterus is merely a symptom, the clinical significance of which must be determined before treatment can be addressed to it. On the differential basis of bilirubinuria one may distinguish between true icterus (or "manifest jaundice") and false icterus.

True icterus is a positive balance in retained bile pigment (bilirubin) of sufficient intensity to stain the plasma, the sclera, the urine and finally the skin and the mucous membranes. From a therapeutic standpoint it must be differentiated from (A) pseudo-icterus and

#### Differential Characteristics of Varieties of Icterus

Variety	Icterus Index	Stereo-bilin	Urobilinuria	Bilirubinuria	Cholelithia
A Pseudo icterus	4.6 Negative van den Bergh	+	0	0	0
B Subicterus	6-15	+	+0	0	0
C Hyperhemolysis icterus	More than 15	+	+	+	+
D Obstructive icterus	More than 15	0	0	+	+
E Hepatosis icterus	More than 15	+	+	+	+0

(B) subicterus. When true jaundice is present, one must distinguish between (C) hyperhemolysis icterus, (D) obstructive icterus and (E) hepatosis icterus. To this must be added (F) icterus of the new-born, which may assume any one of these types.

It must be recognized that there are all possible conditions intermediate between these clinical types. Subicterus may develop into true icterus. Hyperhemolysis jaundice may become obstructive from extreme viscosity of bile. Obstruction may be partial, so that some bile enters the bowel. The obstruction may be intermittent. Hepatosis jaundice may follow any of the other forms and acholic stools may develop in the course of hepatosis icterus. Nevertheless, the distinctions are valid from the therapeutic standpoint, since the treatment is governed chiefly by the type of jaundice present.

#### A PSEUDO-ICTERUS (FALSE JAUNDICE)

Carotenemia due to the eating of large quantities of carrots (e.g., in diabetes) is characterized by lack of staining of the sclera, by a negative van den Bergh reaction (test 7), and by the disappearance of the serum discoloration and later of that of the skin on withdrawal of carrots from the diet.

Painting of the skin with picric acid in malingering is distinguished by the icterus index being normal (from 4 to 6) and the sclera free from bile pigment. When

1. The term hepatosis is employed here with the meaning of extensive degeneration of liver parenchyma cells.

the condition is due to absorption from the application of picric acid to burns or from ingestion, the sclerae are also stained but the urine is free from bile and it contains picramic acid

#### B SUBICTERUS

*Diagnosis*—Subicterus, which might also be called latent jaundice or acholuric jaundice, is characterized by yellow discoloration of the skin, by urobilinuria (test 2) and by moderately increased (below 15) icterus index (test 6) but by the absence of bilirubinuria (test 3), since it requires 1 50,000 bilirubin content of the plasma (4 units van den Bergh) before bile appears in the urine. There is no choluria (test 4) and the stools are of normal color.

*Treatment*—While subicterus is merely an incidence of no direct therapeutic significance in most conditions—such as pneumonia or malaria, septicemia, pernicious anemia, hepatic cirrhosis or hepatic syphilis—its detection is important (a) in patients exposed to poisons, industrial or medicinal, e g, those undergoing arsphenamine treatment and (b) in chronic hemolytic jaundice.

(a) *Toxic Subicterus* This may occur during arsphenamine therapy or when cinchophen is given, or in persons who are industrially exposed to nitrophenol or to aromatic nitroderivatives of benzene, such as dinitrobenzene and phenylhydrazine.

Such individuals should be watched for yellow discoloration of the skin and have routine examinations of the blood icterus index, as this is the best means of detecting the condition early.

The appearance of subicterus calls for (1) immediate cessation of the injections of arsphenamine or the removal of the patient from exposure to the industrial poison, (2) the free administration of carbohydrate (sugar by mouth, dextrose intravenously) to protect the liver cells, (3) giving an abundance of water and (4) calcium administration, which may also be of value. When the arsenicals have been given the administration of sodium thiosulfate, 1 Gm by mouth three times a day and by vein 1 Gm in 20 cc of water daily until the jaundice disappears, is indicated. In hepatic syphilis the arsenicals are contraindicated.

(b) *Chronic Hemolytic Jaundice* This is of therapeutic importance because splenectomy is curative in this condition. It is a disease of the blood-forming organs characterized by abnormal shape and fragility of the erythrocytes (test 10) (hemolysis between 0.6 and 0.42 per cent of sodium chloride) microcytic anemia and large numbers of reticulated cells, splenomegaly, urobilinuria but not bilirubinuria, normally colored feces and no cholema. It is generally a congenital or familial disease but may be acquired. Patients are subject to exacerbations following chilling, exertion or excitement. Febrile attacks with bilious colic due to pigment calculi may occur. Splenectomy should be performed during a period of quiescence of the disease and be preceded by a blood transfusion.

#### C HYPERHEMOLYSIS ICTERUS

Hyperhemolysis icterus is due to hemolysis sufficient in degree to produce bilirubinuria.

*Diagnosis*—This form of jaundice is characterized by bilirubinuria (test 3) without choluria (test 4). Since in this condition there is no normal excretion of bile salts the bile acids are absent from the urine (dissociated icterus). Even though the icterus may become very deep, the itching, bradycardia and tendency to bleeding are absent since the bile pigments themselves

are devoid of toxicity. It is only when "cholema" or the retention of all the other bile products in the blood exists that these toxic effects manifest themselves.

Hyperhemolysis jaundice accompanies conditions in which there is increased hemolysis (leukemia, chronic nitrophenol, or nitrobenzene or phenylhydrazine poisoning) and in those conditions in which hemoglobin is destroyed by phagocytosis and hemosiderosis results (pernicious anemia, malaria, blackwater fever, long continued septicemia). In myeloid leukemia the destruction of hemoglobin is due to encroachment of myeloblastic on erythroblastic marrow, with destruction of the latter. The same condition operates in metastasis of neoplasms to the bone marrow, the myelophthitic anemia thus produced is, if rapid in its evolution, accompanied by jaundice.

*Treatment*—The condition may be physiologic and not require any treatment, as in icterus neonatorum (q v), in which the lysis of the nucleated erythrocytes liberates hemoglobin, the bile pigments from which may be produced so rapidly as to clog the bile canaliculi, resulting in a partially obstructive jaundice.

In pernicious anemia the preformed hemoglobin never finds an adequate stroma to enclose it and may undergo decomposition along the same pathway as hemoglobin liberated by hemolysis from a previously intact corpuscle. The treatment of this condition is the giving of the specific stroma building substance present in the liver or stomach (cf Pernicious Anemia). When an erythrogenic response is reached through the agency of such treatment, the jaundice from this source disappears.

The treatment of the other forms of this type of jaundice, as for example that accompanying the accelerated destruction of red blood cells in septicemia, will depend on an appreciation of the primary factors involved.

#### D OBSTRUCTIVE ICTERUS

*Recognition*—In obstructive icterus the skin and sclerae are stained, the icterus index (test 6) is high and there is bilirubinuria (test 3) but no urobilinuria (test 2) because there is no stercobilin in the stools (test 1). There is also choluria, i e, elimination of bile salt in the urine (test 4) because there is an excess of these salts in the blood (cholema) which results in bradycardia, itching, drowsiness, headache, delirium and coma. Hypercholesteremia (test 9) has the same diagnostic significance as choluria. A hemorrhagic tendency often supervenes.

As acholic stools may also occur in the later stages of hepatosis jaundice the presence of which contraindicates surgical treatment, and since hepatic degeneration may develop in the course of obstructive jaundice liver function tests are of practical importance. Of these the carbohydrate metabolism tests (tests 5 and 8) are the most easily performed, but extensive damage to the liver cells must be present before the changes are reflected by deranged carbohydrate metabolism. The dextrose tolerance test (test 8) is based on the observation that in obstructive jaundice the blood sugar curve continues upward at the end of two hours, while in hepatosis jaundice the curve has returned to or below the initial level by this time. The galactose tolerance test (test 5) which is a simpler test since it merely requires urinalysis, yields an output of less than 3 Gm in obstructive jaundice. In the present state of ignorance as to the relative importance of liver function tests several others may have to be resorted to in a difficult case most especially since there may be a dis-

sociation of the liver function, i e., one function may be much more injured than another (See Additional Liver Function Tests Worth Studying)

**Diagnosis as to Cause**—1 Catarrhal icterus is a benign infectious form of hepatitis rather than, as was previously believed, merely an acute catarrhal chole-  
dochitis. It may occur in epidemics. It may be due to syphilis. Some believe that there may be an "emo-  
tional" form due to spasm of the sphincter of Oddi.

There may be initial fever and malaise, but the later course is afebrile. Nausea and vomiting with loose stools may appear before the jaundice. The feces are acholic at least for a time. The pulse is slow and the blood pressure low. Liver and spleen are moderately enlarged. The liver may be tender. Anemia with leukopenia and relative lymphocytosis follow the early leukocytosis.

The duration is usually three or four weeks, but it may be months. As it may exceptionally develop into the hepatosis type, the prognosis should be guarded.

2 Calculous icterus (see Cholelithiasis) sets in with or is preceded by paroxysms of colic or recurrent

#### High Carbohydrate Low Fat and Low Protein Diet

##### Foods Which May Be Suitable in Cases of Obstructive Jaundice

Foods allowed	
Cereals	Any kind
Cereal products	Macaroni spaghetti, vermicelli noodles bread, crackers
Fruits	Any kind, fresh fruit juices (such as orange juice grapefruit juice or pineapple juice) should accompany each meal
Vegetables	Any kind except cabbage onions turnips
Cheese	Cottage
Beverage	Skim milk buttermilk
Egg	Limit to one per day
Sweets	Sugar jelly jam syrup molasses honey candy (but not chocolates)
Desserts	Cornstarch rice and tapioca puddings, gelatin desserts angel food cake

##### Foods to avoid

Pastries gravies fat meats and bacon butter mayonnaise and salad oils nuts cheese (except cottage cheese) cream chocolate olives

##### Sample Menu

###### Breakfast

Fruit juice stewed fruit  
Cereal with milk and sugar  
Bread with jam  
Coffee with milk and sugar

###### Dinner

Fruit juice  
Lean meat  
Mashed potatoes  
Cooked vegetables  
Bread with jam  
Stewed fruit  
Skim milk

###### Supper

Fruit juice  
Soup crackers  
Cooked vegetables  
Soft cooked egg one  
Bread with jelly  
Tea  
Dessert

febrile icterus, which may occur without pain. There is no gallbladder enlargement, but cholecystography is of no value in the presence of jaundice, as it prevents the excretion of the drug by the liver, and the dye may possibly be harmful. Roentgenography may reveal the presence of opaque stones.

3 Stenosis icterus, most commonly due to neoplasms when occurring in the later years of life, is probably malignant in nature. It lacks the distinguishing features of the other forms and is characterized most especially by its constancy, by its progressive character and by enlargement of the gallbladder.

4 Chronic pancreatitis (q v) presents the additional symptoms of absence of the external pancreatic secretion, and exceptionally there is glycosuria.

**Note to House Physicians**—The admission of a jaundiced patient to the hospital demands the prompt application of tests to determine whether operation is indicated or not while the patient is gotten into the best possible condition for operation.

The urobilin test and the stercobilin test should be repeated daily, as only persistent absence for a week is surgically significant.

The liver function tests are the more valuable the earlier they are done and when repeated, because the insidious development of hepatosis may thus be detected.

**Treatment**—1 General Regimen. It is best to confine the patient to absolute rest in bed for the first week or two even in apparently mild cases of jaundice, but after this period it is best, unless the patient is otherwise disabled, to have him get out of bed, as at this time exercise may favor earlier disappearance of the jaundice.

2 Diet. During the stage at which gastric symptoms dominate, the diet appropriate for the gastric condition should be chosen. As soon as the symptoms have abated, the chief principle of obstructive jaundice diet is the avoidance of fat, an abundance of carbohydrate and a limited amount of protein, preferably vegetable protein, being given.

3 Vitamin D. Because along with the failure of adequate fat digestion there no doubt goes inadequate absorption of vitamins A and D, it is claimed, though not proved, that lack of vitamin D, which makes calcium available for the body's use, may in part be responsible for the bleeding tendency of jaundiced patients (bleeding time, test 11). Solution of Irradiated Ergosterol (Viosterol) may therefore be given with possible advantage in 2 cc doses three times a day, two hours after meals and accompanied by 0.5 Gm doses of Extract of Ox Bile, best administered in double gelatin capsules to produce duodenal action so far as possible.

4 Vitamin C. It will be noted from the detailed dietary that administration of fruit juice is stressed because vitamin C deficiency is particularly prone to produce a tendency to capillary fragility (for test, see Hypovitaminosis C). Whenever achlorhydria is present—and it may be in jaundice—vitamin C is so extensively destroyed in the alimentary tract before it can be absorbed that parenteral administration of ascorbic acid is indicated and a daily dose of 0.6 Gm should be aimed at until the urinary saturation test shows (see Hypovitaminosis C) that the systemic deficiency has been overcome.

5 Water Administration. Though also an item of diet, water administration needs particular stress placed on it because the cholemic factor of obstructive jaundice requires maximum attainable water diuresis to lessen itching and other symptoms of cholemia and to protect the kidneys against damage by the poisons they must excrete. The patient should therefore be encouraged to drink as much water as possible. Several additional advantages may be secured from large, cool enemas, of from 1 to 2 liters of tap water at 60 to 70 F introduced slowly into the colon once or even twice a day and retained by the patient as long as possible. They aid in keeping the intestine clean, they may have a diuretic effect and, by diluting the urine, lessen the danger of nephritis, but most especially are they recommended because they are believed to be capable of increasing the flow of bile (choleretic action) and the temperature at which the injection is to be given is credited with being capable of reflex stimulation to evacuation of the gallbladder (cholagogue effect). No matter what the mode of action, they often help in relieving the pruritus of jaundice. (For the symptomatic relief see Therapy of Itching.)

6 Securing Bowel Evacuation. One should aim at obtaining at least one and not more than two bowel

evacuations a day Phenolphthalein does not act in this condition Cascara sagrada does

(a) Cascara sagrada might be preferred as long as the patient is bedfast It may be given at bed time in doses of from one to four teaspoonfuls of the Aromatic Fluidextract of Cascara Sagrada, enough to secure one or two bowel movements daily

(b) A saline cathartic is likely to be useful when the patient is no longer bedfast It is usually given combined with alkali on the supposition that alkali has a favorable effect on catarrhal inflammation of mucous membranes or, from an empirical standpoint, in an attempt at reproduction of the composition of Karlsbad water, which is famous in the treatment of diseases of the bile passages Probably superior to the natural salt is the prescribing of a saline medicament of such composition as to meet the indications of the case One may simply give the Effervescing Sodium Phosphate, 1 or 2 teaspoonfuls in one-half glassful of water one-half hour before the larger meals If alkalization is also aimed at, one may prescribe Sodium Phosphate combined with Sodium Bicarbonate (prescription 1) If the phosphate is not sufficiently active, one may employ Sodium Sulfate (prescription 2) instead Sodium Phosphate is preferred because less unpleasant to the taste

PRESCRIPTION 1—*Alkaline Saline Laxative*

R	Sodium bicarbonate	30 Gm
	Exsiccated sodium phosphate	60 Gm
M	Label Teaspoonful in cup of hot water one half hour before the larger meals	

PRESCRIPTION 2—*Alkaline Saline Purgative*

R	Sodium bicarbonate	30 Gm
	Exsiccated sodium sulfate	60 Gm
M	Label Teaspoonful in cup of hot water one half hour before the larger meals	

(c) Mild Mercurous Chloride was used religiously in biliary disease by our forefathers in medicine on the supposition that it stimulated bile formation It is now known that it does not do so but that it may possibly act as an intestinal antiseptic For this purpose an occasional dose of mild mercurous chloride (prescription 3) given at bedtime may possibly be of advantage It may add thoroughness to the evacuant therapy practiced Continued, regular dosage is not admissible on account of the danger of mercurialism

PRESCRIPTION 3—*Mild Mercurous Chloride*

R	Six tablets of mild mercurous chloride	0.06 Gm
L	Label One at bedtime as required	

7 Choleric Whether or not it is desirable to stimulate the secretion of bile in jaundice is a question still *sub judice* One might imagine that such an effect might be desirable in catarrhal jaundice and also that increasing the bile pressure might possibly even help the passage of a small stone Should such an effect be aimed at, Sodium Salicylate in doses of from 0.5 to 1 Gm might be employed, and it may conveniently be added to the alkaline saline medication (prescription 4)

PRESCRIPTION 4—*Choleric Alkaline Saline*

R	Sodium salicylate	15 Gm
	Sodium bicarbonate	30 Gm
	Exsiccated sodium phosphate	60 Gm
M	Label Teaspoonful in cup of hot water one half hour before the larger meals	

8 Calcium The hemorrhagic tendency of some jaundiced patients may possibly be antagonized by the administration of calcium, and this should always be given intravenously when a patient with increased clotting time is to be prepared for surgical intervention

To determine whether calcium will be of value in increasing the coagulability of the blood, the following test should be performed Withdraw 2 cc of blood by venipuncture Set 1 cc to coagulate spontaneously To the other cubic centimeter add six drops of 0.5 per cent solution of calcium chloride Determine the coagulation time (test 12) of both specimens If the calcium containing specimen coagulates more rapidly, calcium is indicated, otherwise it is not

(a) One may give 20 cc of the 5 per cent solution of calcium gluconate by very slow intravenous injection at intervals of from four to six hours Unfortunately the effect is transient and rather untrustworthy Caution Slough is liable to follow paravenous injection

(b) If maximal effect from this form of therapy is aimed at, 25 units of Solution of Parathyroid may be given subcutaneously at twelve hour intervals for not more than a week It may be renewed if necessary after an interval of a week

9 Transfusion of Blood or of Blood Serum This is the sheet anchor in jaundiced patients, even in cases of advanced hepatic disease, to lessen the bleeding tendency As the cause of death after operation in these patients is hemorrhage in more than 50 per cent, routine preoperative blood transfusion should be mandatory, as it will usually control oozing at the time of operation

Intramuscular injection of blood serum may suffice to increase coagulability when the number of red blood corpuscles is not markedly reduced Blood serum should indeed be preferred, as the blood corpuscle destruction products increase the existing jaundice It is only when there is a considerable degree of anemia present that the transfusion of 500 cc of compatible whole blood answers best for the preoperative preparation of the patient If human blood is not available, the intramuscular injection of horse serum or of diphtheria antitoxin may be resorted to

10 Duodenal Tube Drainage Drainage of the biliary system by means of the duodenal tube (nonsurgical drainage of the gallbladder) is useful chiefly as a diagnostic procedure, but it may also be of some value in preoperative preparation and as a possible therapeutic measure in cases in which operation entails an unwarranted hazard

When the tube is in the duodenum and its contents have been drained, 50 cc of a 33 per cent solution of magnesium sulfate at body temperature is injected, permitted to remain a while and then drained off for bacteriologic and cytologic examination Another such quantity may be injected, but not more than 90 cc should be permitted to be retained to avoid excessive purgative action For patients suffering from diarrhea, a 5 per cent solution of peptone may be employed instead of the salt

11 Surgical Operation (a) In all cases of obstructive jaundice in which the obstruction is removable (calculi), in which no spontaneous tendency to improvement manifests itself within two weeks, operation should be undertaken as soon as the patient can be gotten into an operable condition

(b) When the obstruction is irremovable (neoplastic), the earlier the operation the better the patient's chances to survive it

(c) In the "catarrhal form" one should postpone operation as long as possible since jaundice of any kind makes all surgical interventions serious but it must not be postponed too long in a persistent case, as operation



is the more serious the longer the jaundice has lasted. Drainage of the gallbladder is rarely advisable earlier than in the second month.

Tachycardia, oliguria, hemorrhagic symptoms and cachexia make surgery extremely hazardous and, in general, contraindicate it. The operative intervention should be limited to relieving the system of the dammed up bile. If the obstructive lesion can be removed easily and safely, this should be done, but, since safety to the patient is paramount, cholecystostomy should be performed when in doubt, with removal of the underlying cause later as the condition of the patient permits.

The following operations are available for the relief of obstructive jaundice:

(a) Cholecystostomy, indicated in cholelithiasis with cholangitis, and in catarrhal icterus of excessive duration.

(b) Choledochotomy for common bile duct stone that cannot be dislodged.

(c) Cholecystogastrostomy whenever there is nonremovable obstructive lesion of the common bile duct below the cystic duct.

#### PREOPERATIVE CARE OF GALLBLADDER CASES

Whenever possible, at least three or four days of preparation should be required. Bleeding (test 11) and clotting time (test 12) should be estimated daily so as to choose the optimum time for operation, and calcium infusion employed if indicated.

The patient's blood should be typed and suitable blood be made available as emergency postoperative blood transfusion may become imperative to save life.

Diet should include from 300 to 500 Gm of carbohydrate daily. The eating of sweets should be encouraged. Syrup (150 cc) in some flavoring fruit drink should be given the evening before and early the morning of the operation if the stomach is retentive. If it is not, dextrose phlebotomy (5 per cent) is mandatory.

Blood transfusion (500 cc) should be given shortly before operation or if the red blood corpuscles are not required by marked anemia, human serum or horse serum should be injected intramuscularly.

#### POSTOPERATIVE CARE OF GALLBLADDER CASES

1 *Posture*—In simple cholecystectomy any posture which is comfortable to the patient may be taken. In drainage cases, the sitting posture at an angle of about 35 degrees promotes drainage, as does Sims' posture.

2 *Phlebotomy*—Dextrose (5 per cent) phlebotomy should be given for at least the first twenty-four hours. Salt solution should be administered if the urine shows a deficit of sodium chloride.

3 *Diet*—Water may usually be allowed about six hours after operation. If vomiting persists, gastric suction (Wangenstein method) should be instituted, and parenteral fluid administration is indicated. After twenty-four hours, if the intestine has not been subjected to operation, a residue-low diet (q.v.) may be started.

4 *Insulin*—Administration of insulin (from 15 to 20 units a day) plus an adequate amount of sugar may be advisable during the second week postoperatively to combat the asthenia with anorexia and resulting emaciation, which may result in death. The insulin may antagonize the anorexia and the better utilization of the sugar combat the malnutrition.

5 *Pain*—Pain indicates nitrite administration (Amyl Nitrite inhalation a few whiffs, or Glycerol Trinitrate

0.6 mg) may be superior to hypodermic injection of Morphine, as pain due to biliary colic sometimes troubles these patients and morphine increases while nitrite releases spasm of the sphincter of Oddi.

6 *Hemorrhage*—This symptom or even capillary oozing indicates blood transfusion, repeated as required.

7 *Biliary Infusion*—The McArthur drip method, by way of bile drainage tube or bile fistula of from 500 to 3,000 cc of warm sterile dextrose solution (with salt if there is a deficit of sodium chloride), is indicated in persistent postoperative vomiting and in cases associated with toxic nephritis. The biliary drainage tube is attached to an irrigator the outflow of which is so adjusted as to deliver the fluid drop by drop. The height of the irrigator does not exceed 20 inches above the patient's abdomen. If pain is experienced, the rate of flow should be lessened. If this does not relieve the pain there is obstruction to the entrance of fluid into the duodenum.

8 *Cholangiography*—Roentgenography after injection of from 10 to 20 cc of contrast medium (Ippuran or diodrast) into the bile passages enables one to decide how long the biliary tree should be drained. Patency of the common bile duct may thus be confirmed. Indeed the injection may help to flush out small stones, sand, or mucous plugs.

9 Complicating acidosis, alkalosis, hepatic or renal insufficiency or peritonitis must be looked out for and appropriate treatment for these must be instituted should any of these appear.

#### E HEPATOSIS ICTERUS, ICTERUS GRAVIS, TOXIC JAUNDICE

Hepatositis icterus, icterus gravis or toxic jaundice is due to acute functional liver insufficiency resulting from extensive degeneration of liver cells, such as may result from phosphorus or cinchophen poisoning or occur in acute yellow atrophy of the liver, yellow fever, spirochetosis ictero-haemorrhagica (Weil's disease) or congenital syphilis (rare), and as a terminal event in hepatic cirrhosis.

*Diagnosis*—Malaise, epigastric pain and tenderness, nausea and vomiting are followed by jaundice, which is subordinate to the constitutional symptoms, hemorrhages from the gastro-intestinal tract, evidences of nephritis and finally stupor, coma and death. The excretion of bile, while augmented at first, may later cease, so that light colored or even acholic stools may result.

In addition to other liver function test methods (tests 5, 8 and 9) the finding of tyrosinuria indicates liver degeneration.

*Treatment*—1 Causal treatment should, of course, be aimed at and a diagnosis of the underlying etiology arrived at as expeditiously as possible.

2 Absolute rest is imperative.

3 The therapeutic value of dextrose phlebotomy in jaundice cannot be overestimated. Numerous observers agree that intensive dextrose therapy is of first importance and that other measures are only adjuncts in these cases. It must be given intravenously, as then the glycogen is deposited in the liver more liberally than when the sugar is taken by mouth. Drip phlebotomy of 10 per cent dextrose solution should aim at giving the patient from 300 to 500 Gm in the twenty-four hours and enough salt should be introduced to maintain at least 0.3 per cent excretion of sodium chloride in the urine.



4 Diet consists of the ingestion of carbohydrate. The eating of candy should be encouraged. Protein should be limited to the basal requirement and in critical conditions temporarily withheld.

5 Insulin should be given to those patients who receive large amounts of dextrose and in whom hyperglycemia develops, or who spill sugar in the urine. The proportion of 1 unit of insulin to every 3 Gm of dextrose lost is advisable.

6 Blood transfusions are especially indicated when jaundice is complicated by purpura, anemia, spontaneous hemorrhages, low serum protein and failure to show gain on dextrose therapy alone.

#### F ICTERUS OF THE NEW-BORN

It is important to differentiate between (1) the mild and (2) the grave form of icterus of the new-born.

1 In the mild form, prognosis is good.

(a) Icterus neonatorum is so common, occurring in almost 80 per cent of infants on the first or second, rarely the third or fourth day, that it may almost be called "physiologic jaundice." It is usually a subicterus, as the urine is normal, but it may become a hyper-hemolysis icterus. There are no other symptoms. It requires no treatment.

(b) Catarrhal icterus with biliuria, acholic stools and slow pulse is very rare in the new-born. The principles of treatment are the same as those employed in older children.

2 In the grave form prognosis is bad.

(a) Obstructive icterus may be due to congenital syphilis and require its specific therapy, or to congenital malformations or gallstones (rare) and require surgical intervention.

(b) Hepatosis icterus (icterus gravis neonatorum) may be due to infection through the umbilicus and appear in epidemics. Its occurrence is favored by bathing infants before the site of the umbilical cord has healed, but the infection may also be intestinal in origin. It sets in about the fifth day of life with fever and rapid pulse, vomiting and diarrhea, hemorrhages, bronzed skin and restlessness. When the patient passes into coma it usually ends in death.

The principles of treatment are the same as in icterus gravis of adults. Antistreptococcus serum may be tried in infection of the umbilical cord.

(c) Grave familial jaundice may be an exaggerated form of the physiologic icterus. Intramuscular injection of the mother's blood serum may help.

#### TESTS THAT MAY BE OF USE IN JAUNDICE CASES

##### A Test made on the feces

TEST 1—*Test for Stercobilin (Schmidt's Stool Bile)*  
Reagent Saturated aqueous mercury bichloride solution.

Procedure Rub a small amount of fecal material with mercury bichloride solution and let stand for twenty-four hours. The work is conveniently carried out in small beaker, evaporating dish or watch glass. Urobilin, which is present normally in the feces, gives a red color. A green color is given by unchanged bilirubin, which is not seen normally.

##### B Tests made on the urine

TEST 2—*Urobilinogen* Urobilin (excreted as the chromogen urobilinogen) is normally present in the urine in too small an amount for detection by the ordinary tests. Its quantity is increased in conditions in which there is (a) excessive destruction of red blood corpuscles, as in hemolytic jaundice; pernicious

anemia, malaria, (b) when the oxidizing function of the liver is impaired, e.g., by cirrhosis, poisons (arsphenamine, phosphorus, lead), congestions and in infectious diseases. Urobilinuria is nearly or entirely absent in obstructive jaundice. Provided hemolysis can be excluded, a positive reaction is of great value, indicating impairment of hepatic function. Temporary urobilinuria may be caused by constipation.

Test for Urobilinogen (*Ehrlich's Modified*) Reagent 2 Gm of paradimethylamidobenzaldehyde in 100 cc of 20 per cent hydrochloric acid.

Procedure (It is best to use individual specimens rather than a mixture of a twenty-four hour quantity.) To 10 cc of urine, add ten drops of reagent. Add 3 or 4 cc of chloroform. Hold a finger over the top of the tube or stopper with a cork and mix thoroughly by holding the tube horizontally and with a slow motion moving tube back and forth. Let the chloroform settle to the bottom.

Result A pink to red color develops in the chloroform layer in the presence of urobilinogen. A yellowish color is not significant.

TEST 3—*Test for Bilubinuria (Gmelin Test)* Reagents Calcium hydroxide (10 per cent) or lime water. Be sure the lime water is active. Concentrated yellow nitric acid.

Method To from 10 to 15 cc of urine add sufficient lime water to form firm precipitate of calcium salts. Such will have carried down by adsorption any bile pigments which may be present. Filter and lay filter paper containing the precipitate on a flat surface. Touch the precipitate lightly with a drop of nitric acid, using either a glass rod or a dip tube. A play of colors from yellow through green to violet denotes the presence of bile pigments.

TEST 4—*Tests for Bile Acids (Choluria)* Hay's Test This test depends on the fact that bile acids lower the surface tension of the urine. It is delicate to a dilution of 1:120,000.

Reagent Finely divided and dry sublimed sulfur.

Procedure On surface of 10 cc of urine cooled to below 17°C sprinkle some finely divided sulfur. Note whether the sulfur sinks or not, and also the rate of sinking. Preservation with thymol interferes with this test.

Furfural Test Reagent 1:1,000 aqueous solution of furfural. Concentrated sulfuric acid.

Procedure To 5 cc of urine add three drops of furfural solution. Holding the tube on a slant, carefully run about 5 cc of sulfuric acid down the side. Note the junction of the two liquids. In presence of bile acids a red ring develops. Care should be taken not to let tube become too hot (over 70°C).

TEST 5—*Galactose Tolerance Test* This test has the advantage of not requiring venipuncture, but one must rule out presence of concomitant diabetes mellitus. Collect specimen of urine between one and two hours after an ordinary meal on the day preceding the galactose test. If the patient has any tendency toward diabetes, dextrose will be found in this specimen, unless there is a high renal threshold. If this is so, at least there will be no dextrose present in the urine to interfere with the galactose test. As galactose has no renal threshold, a high threshold for dextrose does not interfere. If the patient has diabetes, the dextrose will have to be eliminated from the urine by means of fermentation with pure yeast.

Reagents Galactose, chemically pure, 40 Gm in 500 cc. of water. It may be flavored with lemon juice to make it more palatable. Benedict's reagent. Sodium carbonate crystals. Powdered pumice.

Procedure Patient should have no breakfast. Obtain a specimen of urine. Give the patient the galactose solution to drink. Collect specimens hourly for the next five hours and record the quantity having been previously eliminated, any reducing sugar present can be assumed to be galactose. Pool those specimens showing reduction and determine the amount of galactose quantitatively.

Dilute 10 cc of urine to 50 cc with water. This should be done volumetrically so that the dilution is accurate. Mix thor-

oughly and pour into a buret. Place 25 cc of Benedict's reagent in a large evaporating dish (measure with a pipet or if the pipet is not large enough use a buret). Add 15 Gm of crystallized sodium carbonate and a few grams of powdered pumice. Heat to boiling until the carbonate has entirely dissolved. Take a reading before urine is discharged into copper solution, then run in diluted urine rapidly until a white chalky precipitate forms. From that point add urine drop by drop until the color has entirely disappeared and note the number of cubic centimeters of urine used. Keep the solution boiling vigorously during the procedure.

**Calculation.** Twenty-five cc of solution is neutralized by 67 mg of galactose. Therefore the number of cubic centimeters of urine needed to decolorize the solution contained 67 mg of sugar, but the specimen was diluted five times and therefore  $\frac{0.067 \times 500}{1} =$  percentage of urine present in pooled

specimen. From the percentage of galactose eliminated, determine the number of grams by calculating the actual number of cubic centimeters of urine that made up the pooled specimen. Thus, if a patient voided 150 cc and the result of the determination gave 3 per cent, the patient would have eliminated 45 Gm of galactose in the 150 cc of urine.

**Interpretation.** An output of 3 Gm or above is abnormal and speaks for liver damage. The average urinary output of galactose is less than 1 Gm, and it usually appears in the first and second specimens in normal persons. In obstructive jaundice the output is less than 3 Gm, so that the test is of little value in this type of jaundice, but in hepatitis jaundice it is more than 3 Gm.

This test is of no value as a general liver function test but is invaluable in the differential diagnosis of jaundice, especially if made early. It is of greatest value in painless jaundice of middle and later life and may prevent unnecessary surgery in hepatitis jaundice.

### C Tests made on the blood

**TEST 6—Icterus Index Estimation.** This depends on the intensity of yellow pigment of the serum compared with a standard aqueous potassium bichromate solution (1 10,000) and reported in arbitrary units, expressed as the icterus index. The normal range is between 4 and 6, subicterus or "latent jaundice" up to 15. Beyond this figure the patient usually shows evidence of true icterus. In cases of obstructive jaundice there may be from 150 to 200 units, and it may be extremely high from 300 up in cases of hepatitis jaundice.

**Reagents.** A 1 10,000 aqueous potassium dichromate. Physiologic solution of sodium chloride. Six test tubes of the same caliber.

**Procedure.** Measure 1 cc of serum in a pipet. Dilute with a measured amount of physiologic solution of sodium chloride until nearly the color of the standard. Compare this diluted unknown against the standard in a suitable colorimeter.

**Calculation.**  $\frac{\text{Reading of standard}}{\text{Reading of unknown}} \times \text{dilution of unknown} = \frac{\text{icterus index}}{\text{index}}$

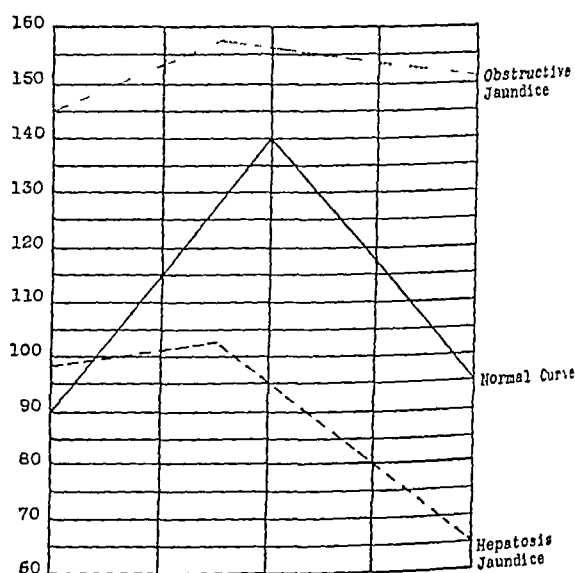
**TEST 7—Van den Bergh Test (Qualitative Test Modified).** There are several types of reactions. We are concerned here with only the direct reaction. The direct reaction is either immediate or delayed. The immediate reaction develops as soon as the reagent is added to the serum. The delayed reaction does not begin until after thirty seconds and may not reach its maximum color until after two or more minutes. An immediate red color becoming deep violet points to an obstructive jaundice. Delayed reactions may be given by normal serums and those of hepatitis jaundice. The reaction is negative if no color develops within thirty minutes. Occasionally serums from patients with obstructive jaundice fail to reach their maximum before two or more minutes has elapsed. Serums from patients with toxic or infective jaundice usually reach their maximum after thirty seconds.

**Reagents.** Solution 1. Sulfanilic acid 1 Gm, concentrated hydrochloric acid 15 cc, distilled water to 100 cc.

Solution 2. Sodium nitrite 0.5 Gm, distilled water to 100 cc. To prepare fresh reagent add 5 cc of solution 1 to two drops of solution 2.

**Procedure.** Draw approximately 6 to 8 cc of blood. Allow to clot, centrifugating if necessary. Pipet off the serum and measure accurately with a graduated pipet 1 cc into a clean, dry test tube. Add 1 cc of freshly prepared reagent. Note the development of color. Watch the time of development of color, so that the time taken for development can be reported accurately.

**TEST 8—Dextrose Tolerance Test.** The patient should have no breakfast. A specimen of blood of the fasting patient is drawn, and then the patient is given 100 Gm of dextrose dissolved in 200 cc of water. Since dextrose dissolves slowly and possibly must first be heated, it must be prepared in advance. The juice of one lemon added to the solution will make it more palatable. Forty-five minutes after ingestion of the dextrose another specimen of blood is drawn. A third specimen is obtained two hours after the ingestion of the dextrose. Note. Oxalated blood is used for this determination. The specimens should be kept in a refrigerator until the determinations are made so as to avoid hemolysis. A curve should then be plotted and compared with those given in the accompanying chart.



Normal curve and curves characteristic of obstructive jaundice and hepatitis jaundice

If the curve of obstructive jaundice is obtained, diabetes mellitus must be ruled out, as it may give a similar curve. The fasting blood sugar may be high in a well developed case of diabetes, but one cannot take for granted that a result on the fasting blood within normal limits indicates absence of a diabetic state.

**TEST 9—Cholesterol Estimation.** This is of differential value, as the liver removes cholesterol from the blood and excretes it in the bile. In obstructive jaundice the cholesterol content is high (from 300 to 400 mg), in liver degeneration it is normal (from 130 to 170 mg) or it may be markedly decreased (grave prognosis). High values are also found in nephrosis, diabetes mellitus in which recent treatment with insulin has not been given and after diets high in lipids.

Oxalated blood is used for this test. Draw about 5 cc of blood. The cholesterol is determined by extracting the lipids by means of ether-alcohol mixture. The extract is saponified and the cholesterol is then extracted by chloroform. The freed cholesterol is determined quantitatively by the colorimeter.

**Procedure.** Into a 50 cc volumetric flask put about 40 cc of ether and alcohol mixture (ether 1 part, alcohol 3 parts), add 15 cc of oxalated blood and keep the flask in motion while it is being added. Immerse the flask in boiling water until its contents reach the boiling point (six or even eight minutes). Keep the flask in motion all the time it is in the boiling water. Avoid overheating. Cool and add alcohol mixture to it.

50 cc mark Mix and filter Transfer 10 cc of filtrate to a beaker and evaporate over a water bath to nearly dryness, keeping the beaker level, then add 2 cc of chloroform Heat to boiling and transfer to a 10 cc graduated cylinder Add 2 cc of chloroform Heat to boiling Transfer to the same cylinder Repeat the third time If the three portions exceed 5 cc, evaporate to 5 cc, if less, add enough chloroform to make 5 cc

Into a 10 cc graduated cylinder put 5 cc of Standard Cholesterol Solution To each cylinder add 2 cc of anhydrous acetic acid and 0.1 cc of concentrated sulfuric acid Mix and place in the dark for from six to eight minutes Compare colors in the colorimeter

Calculation The standard is set at 15 Twenty-five hundred divided by the reading of the unknown gives the number of milligrams of cholesterol in 100 cc of blood Note Be sure that every pipet, tube and beaker is very dry

TEST 10—*Fragility of Red Cells (Sanborn Modification)*  
Reagents 0.5 per cent sodium chloride solution made from freshly dried chemically pure sodium chloride

Procedure Label twelve small test tubes (be sure the tubes are of the same caliber) from 25 to 14 inclusive With a capillary pipet put into each tube the number of drops of stock sodium chloride solution indicated by the number on the tube, i.e. twenty-five drops in tube 25 down to fourteen drops in tube 14 Then wash out the pipet carefully with distilled water Using the same pipet bring up the volume of fluid in each tube to twenty-five drops with distilled water Draw blood from the patient by means of venipuncture into a dry syringe, taking from 1 to 1.5 cc Transfer a drop of blood immediately to each tube (For accurate results the same caliber needle should always be used, a No. 21 is convenient) Mix by inverting the tubes carefully so as not to fracture red cells artificially Let stand at room temperature for two hours and read the results

Results Corpuscles will have settled to the bottom and any hemolysis is noted by discoloration of the supernatant fluid The reading is taken in the tube showing the slightest amount of color

Calculation Multiply the number indicated on the tube by 0.02

Interpretation Normal blood hemolyzes at from 0.42 to 0.44 concentration of sodium chloride although a variation between 0.02 and 0.04 is considered to be within normal limits Increased fragility is seen in hemolytic jaundice, which shows complete hemolysis at 0.48 Chronic obstructive jaundice shows no abnormality of hemolysis In pernicious anemia there is increased resistance

TEST 11—*Bleeding Time Determination (Ivy Technique)*  
The cuff of a sphygmomanometer is applied around the arm with a pressure of 40 mm of mercury Puncture on the inner side of the forearm is performed with a mechanical stylet set at a depth of about 2.5 mm and drops of blood are taken on filter paper every ten seconds until the bleeding has stopped This is determined by the fact that no red blot is formed on the paper when the site is touched with the paper Be careful to avoid fallacies produced by small amounts of blood gathering about the site of the puncture It is best to wipe such away between times that tests are made Count the number of blots on the paper Multiply by 10 This will give the bleeding time in seconds

TEST 12—*Coagulation Time (Peterson and Mills 1923)*  
Capillary tubes (from 0.6 to 0.8 mm inside diameter and 1¼ inches in length) are filled by capillarity up to about one-quarter inch from the end Puncture like that used in test 11 is the method of obtaining blood excepting that no tourniquet is needed The filled tube is immediately placed in one of the creases of the palm of the examiner's hand and the hand is closed over it Coagulation is recognized by failure of the blood column to move within the tube when it is inverted by pronation and supination of the hand momentarily opened to permit inspection If such observation is doubtful, a small

piece of the tube may be broken off, and if a firm clot has formed a strand of fibrin will extend between the broken off portion and the remainder of the blood Determine the number of seconds from the time the puncture is made until the final results are read

#### ADDITIONAL LIVER FUNCTION TESTS WORTH STUDYING

*Phosphatase Test (Robert's, Modified)* Tests are to be made on fasting blood Citrated blood is to be used Oxalated blood cannot be used because potassium oxalate is usually used Be careful of this if citrate is not handy then sodium oxalate can be used About 10 cc of blood should be taken and immediately transferred to a container with anticoagulant The test is made on the plasma, so here too care must be used to avoid hemolysis The amount of inorganic phosphorus is determined before and after the action of phosphatase enzyme and the amount of phosphatase is then reported in units per hundred cubic centimeters of blood

Procedure Two cubic centimeters of plasma (citrated blood) is mixed with 2.3 cc of distilled water and 0.7 cc of tenth normal sodium hydroxide This produces a  $pH$  of approximately 8.9 To this is added 1 cc of a 1 per cent solution of sodium beta-glycerophosphate The mixture is then incubated at 37.5°C for two hours, after which its inorganic phosphorus content is determined by the method of Fiske and Subbarow<sup>2</sup> At the same time the initial inorganic phosphorus content of the plasma is determined, another 2 cc of the original blood being used Both of these values are determined in milligrams per hundred cubic centimeters of blood plasma The difference between these two values represents the number of milligrams of inorganic phosphorus liberated by the enzyme phosphatase from the substrate under the foregoing conditions Each milligram thus obtained is expressed as units of phosphatase per hundred cubic centimeters of blood plasma

*Albumin-Globulin Ratio Determination* Nonobstructive jaundice shows a low serum albumin and a high serum globulin In some cases an inversion of the albumin-globulin ratio may occur No apparent change in this ratio occurs in cases of obstructive jaundice

*Hippuric Acid Test and Urea Clearance Test (Dr Quick)* This is valuable as a prognostic agent in determining the amount of liver damage (such is not always commensurate with the degree of jaundice present), especially when hepatobiliary surgery is contemplated, as "liver deaths" can thus be avoided The test is valuable also in determining the amount of liver damage caused by syphilis and in the differential diagnosis between acute arsenical hepatitis and syphilitic hepatitis

This test depends on the fact that glycol has the power to conjugate noxious substances in the liver (early thought to be a function of the kidneys), and so the detoxifying power of the liver can be determined

Procedure The patient is given 5.9 Gm of sodium benzoate in half a glassful of water at 8 a.m. Breakfast is limited to coffee and plain toast Specimens of urine are collected at hourly intervals for the next four hours The amount is measured and then pooled

<sup>2</sup> Fiske C. H. and Subbarow Yellapragada J Biol Chem 66: 375 (Dec.) 1925

Because the excretion of hippuric acid does have a renal threshold, it is necessary to make a urea clearance test (van Slyke method) on the urine at the time the hippuric acid test is made. Unless the urea clearance is less than 20 per cent of the normal, there will be no interference with the hippuric acid excretion.

**Tyrosinuria and Tyrosinemia** Tyrosine and leucine are usually found together in the urine. They may be present<sup>3</sup> in cases of liver damage, especially phosphorus poisoning, in acute yellow atrophy and also in leukemias.

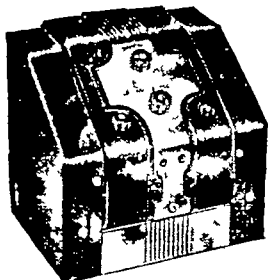
## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT H. A. CARTER Secretary

### WAPPLER COLD CAUTERY-SCALPEL ACCEPTABLE

Manufacturer: Compres Division, American Cystoscope Makers, Inc., 450 Whitlock Avenue, New York.

The Wappler Cold Cautery-Scalpel is a portable electro-surgical unit designed to provide power for electrosurgical procedures as well as to supply light for diagnostic instruments. It is recommended by the firm for such surgical measures as coagulation, cautery, cutting, including underwater cutting, hemostasis and cervical conization.



Wappler Cold Cautery Scalpel

Housed in a black bakelite case with chrome trim, the unit fits into a leather case with zipper and pocket for footswitch. It weighs 13 pounds and the dimensions are approximately 7 by 7 by 8 inches. Two distinctive features are (1) a drawer, serving also as a sterilizing tray, which works automatically at the press of a button, and (2) self-contained cords, similarly operated, which retract inside the unit. A single control knob permits the selection of the type of current for the effect desired. Several sets of bipolar electrodes are available. For sterilization, the drawer and contents may be placed in an autoclave or boiled. A foot switch operates the surgical current while the diagnostic light current is used independently.

Electrosurgical current is supplied by a vacuum tube circuit. The diagnostic light circuit is designed to operate lamps simultaneously with surgical current and from the same source eliminating the batteries commonly required with cystoscopic instruments. It operates at 110 volts, 50-60 cycle alternating current. The power input is 250 watts maximum. No value is given for output, since no reliable means for measuring this value has been decided on. The transformer temperature rise after a two hour run on intermittent load was within the limits of safety.

The unit was tried out clinically by an investigator appointed by the Council and reported to be satisfactory for general surgical work. However, it does not appear to produce a true desiccating current. Even when the current is cut down to a small amount and used with only a small needle, it causes coagulation rather than desiccation.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Wappler Cold Cautery-Scalpel electrosurgical unit for inclusion in its list of accepted devices.

<sup>3</sup> Presence is determined by the method described in the following articles:  
Lichtman S. S. and Sobotka Harry. An Enzymatic Method for the Detection of Tyrosine in the Urine. *J. Biol. Chem.* 85: 261 (Dec.) 1929.  
Jankelson I. R., Segal M. S. and Aisner Mark. Tyrosinemia and Its Relation to Pathology of the Liver. *Am. J. M. Sc.* 193: 241-246 (Feb.) 1937.

## Council on Pharmacy and Chemistry

### REPORT OF THE COUNCIL

BECAUSE OF STATEMENTS WHICH HAVE BEEN MADE IN THE ADVERTISING OF SEDORMID THE COUNCIL DEEMS IT NECESSARY TO PUBLISH A REPORT ON THIS PREPARATION. A COMPETENT PHARMACOLOGIST WAS CONSULTED BECAUSE OF HIS SPECIAL KNOWLEDGE OF THIS SUBJECT. THE COUNCIL'S REFEREE EXAMINED THE STATEMENT PREPARED BY THE CONSULTANT AND THE ADVERTISING WHICH WAS AVAILABLE TO HIM. THE STATEMENT OF THE CONSULTANT IS TOO LONG FOR PUBLICATION IN FULL, BUT THE COUNCIL ADOPTED AN ABSTRACT OF THAT STATEMENT AND AUTHORIZED ITS PUBLICATION AT THE SAME TIME THE COUNCIL DECLARED SEDORMID NOT ACCEPTABLE FOR NEW AND NONOFFICIAL REMEDIES BECAUSE OF THE CLAIMS WHICH THE COUNCIL HOLDS TO BE UNWARRANTED.

PAUL NICHOLAS LEECH Secretary

### SEDORMID NOT ACCEPTABLE FOR N. N. R.

In this issue of THE JOURNAL (p. 725) Hoffman, Kahn and Fitzgibbon discuss work on Sedormid, which is referred to in this report. There also appears in this issue a clinical note by Moody (p. 726).

Sedormid (dormire, Latin, to sleep) is the therapeutically suggestive name of a sedative and hypnotic drug marketed by Hoffmann-La-Roche, Inc.

The referee has examined seventeen pieces of advertising for Sedormid. Fourteen of these were received in the Council's office during the years 1930-1936, three are found in the *Roche Review* for 1937. The referee finds little essential change in the general character of the advertising for those years. Certain objectionable statements are assembled in order to facilitate their consideration. Naturally, those statements which do not require criticisms are not included. Not one word of warning to indicate that the use of Sedormid involves the least danger was found in these seventeen pieces of advertising, on the contrary, an advertising circular which the Council office received Oct. 1, 1935, contains the following:

As a hypnotic Sedormid is indicated in all cases of insomnia regardless of the cause of the sleeplessness.

Sedormid is a carbamide, and is not affected by legislation aimed solely at barbiturates.

"It is non-cumulative even when taken regularly for long periods."

Sedormid is an unusually safe sedative and hypnotic producing its therapeutic effects in doses far below the possibility of toxicosis. It is very quickly and completely oxidized in the body and is rapidly eliminated, so that even after large doses only traces are found in the urine the day after administration. Cumulative effects are therefore entirely absent.

As a daytime Sedative. Bromides in ordinary doses are too weak. Barbiturates are too strong, Sedormid neither a bromide nor a barbiturate, meets the indication precisely.

The *Roche Review* May 1937, states "Its action while mild, is prompt, and in therapeutic doses its toxicity is practically nil."

It is stated many times in the advertising that Sedormid is neither a bromide nor a barbiturate, but a carbamide. It may, in fact, be considered a derivative of alurate, one of the most active of the barbiturates in general use. Alurate is allyl isopropyl-barbituric acid, Sedormid is allyl isopropyl-acetyl-carbamide. Its pharmacologic and therapeutic actions resemble those of the barbiturates.

It is obvious that no single hypnotic is "indicated in all cases of insomnia, regardless of the cause of the sleeplessness," that suitable doses of barbiturates are not too strong, that suitable doses of bromides are not too weak, that therapeutic doses of barbiturates are not too toxic, since the therapeutic excludes the toxic. Though, of course, doses usually used therapeutically may cause toxic effects in some patients, especially when they are given in unsuitable cases. The paper on Sedormid which appears in this issue of THE JOURNAL affords abundant evidence that Sedormid, like one of the barbiturates, may cause toxic effects.

There are only two recent reports of experimental studies of Sedormid with which the referee is acquainted. Fromherz investigated the spasmolytic action on excised strips of rat intestine and uterus, and frog ventricle. Fromherz drew important deductions from this work with reference to therapeutic uses of Sedormid.

1. Fromherz K. Arch. f. exper. Path. u. Pharmacol. 173: 1.

Gatti<sup>2</sup> determined the hypnotic, sedative and fatal doses of Sedormid for rabbits and guinea pigs. His report is not sufficiently detailed to permit of a satisfactory analysis. Of greater practical importance for the present report are the results of experiments performed under the direction of the consultant of the Council, in these experiments intramuscular doses of 0.1 Gm of Sedormid per kilogram were fatal to pigeons but were without demonstrable effects when such doses were administered to rabbits. Doses of one fourth of the fatal dose caused only slight depression in pigeons.

Fontanier<sup>3</sup> reported fatal poisoning by fifty-one tablets (12.75 Gm) of Sedormid, the amount being equal to the average fatal dose of barbitol for man. The symptoms were closely similar to those seen in fatal barbitol poisoning and included unconsciousness, rapid and stertorous respiration, irregular and intermittent pulse of increased frequency, miosis, abolition of the corneal reflex, increased temperature and, later, bronchopneumonia. The histologic changes in the central nervous system were identical with those observed after fatal barbitol poisoning.

Verbiest<sup>4</sup> reported severe poisoning in a patient of 50 who had taken twenty tablets containing about 5 Gm of Sedormid. There was unconsciousness, with cardiac weakness requiring active treatment, followed by complete recovery in three days.

Six observers have reported eleven (possibly twelve) cases of thrombopenic purpura following the use of repeated small doses of Sedormid. It is not necessary to discuss these further in this place, since several of them are discussed by Hoffman, Kahn and Fitzgibbon in this issue of THE JOURNAL.

The Council declared Sedormid (Hoffmann-La-Roche, Inc.) unacceptable for New and Nonofficial Remedies because of the dangerously misleading statements in the advertising (conflict with Rule 6), and authorized the publication of this report.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

### NEOARSPHENAMINE-D R L (See New and Nonofficial Remedies, 1937, p. 86)

The following additional dosage form has been accepted:

*Neoarphenamine and Metaphen D R L.* Packages containing five ampules of neoarphenamine D R L, 0.04 Gm each and one bottle (20 cc) of metaphen solution 1:1000.

*Actions and Uses.*—Neoarphenamine and metaphen is proposed for the treatment of Vincent's gingivitis and stomatitis.

*Dosage.*—Neoarphenamine 0.04 Gm is diluted with 4 cc of the 1:1000 aqueous solution of metaphen and the resultant solution is applied topically.

### CONCENTRATED POLLEN ANTIGENS-LEDERLE (See New and Nonofficial Remedies, 1937, p. 35)

*Mixed Grasses Concentrated Pollen Antigen Lederle (June Grass Orchard Grass Sweet Vernal Grass Red Top and Timothy in equal parts).* Also marketed in five syringe packages (series D) each syringe containing 3,000 pollen units and in five syringe packages (series E) each syringe containing 6,000 pollen units.

### METAPHEN (See New and Nonofficial Remedies, 1937, p. 295)

The following dosage form has been accepted:

*Metaphen Ophthalmic Ointment.* Metaphen 1:3,000 in an ophthalmic ointment base containing anhydrous wool fat 25 per cent and petrolatum 75 per cent.

### POLLEN ANTIGENS-LEDERLE (See New and Nonofficial Remedies, 1937, p. 37)

*Mixed Grasses Pollen Antigen Lederle (June Grass Orchard Grass Sweet Vernal Grass Red Top and Timothy in equal parts).* Also marketed in five syringe packages (series D) each syringe containing 3,000 pollen units and in five syringe packages (series E) each syringe containing 6,000 pollen units.

### MERCURIC SUCCINIMIDE (See New and Nonofficial Remedies, 1937, p. 288)

*Impoules Mercury Succinimide 0.01 Gm (1/10 grain).* Mercuric succinimide U. S. P. 0.01 Gm in distilled water to make 1 cc. Prepared by the Lakeside Laboratories, Inc., Milwaukee.

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary

### GOLDEN GATE BRAND MACARONI PRODUCTS

*Manufacturer.*—Golden Gate Macaroni Company, Inc., San Francisco.

*Description.*—Macaroni of various sizes and shapes prepared from durum wheat semolina.

*Manufacture.*—The sifted durum semolina and water, in definite proportions, are mechanically mixed and kneaded. The resulting dough is forced through various dies to form the different shapes of macaroni products, which are dried on racks under controlled conditions and packed in cellophane bags.

*Analysis* (submitted by manufacturer).—Moisture 13.4%, total solids 86.6%, ash 0.6%, fat (ether extract) 0.2%, protein (N x 5.7) 13.3%, reducing sugars as dextrose 0.7%, sucrose 1.7%, crude fiber 0.2%, carbohydrates other than crude fiber (by difference) 72.3%.

*Calories.*—34 per gram, 97 per ounce.

### LESLIE BRAND IODIZED TABLE SALT

*Manufacturer.*—Leslie Salt Company, San Francisco.

*Description.*—Table salt containing 1 per cent magnesium carbonate and 0.02 per cent potassium iodide.

*Manufacture.*—Salt brine is obtained from sea water by spontaneous evaporation in ponds. The crude salt is washed with saturated salt solution to remove other soluble salts, then refined by dissolving in distilled water and precipitating out salts other than sodium chloride, and dried. Magnesium carbonate and potassium iodide are added and the salt is packed in cartons.

*Analysis* (submitted by manufacturer).—Moisture 0.01%, silica and iron oxide (SiO<sub>2</sub> & Fe<sub>2</sub>O<sub>3</sub>) trace, calcium sulfate (CaSO<sub>4</sub>) 0.01%, calcium carbonate (CaCO<sub>3</sub>) 0.08%, basic magnesia (Mg[OH]2.4MgCO3.5H<sub>2</sub>O) 0.97%, potassium iodide (KI) 0.02%, sodium sulfate (Na<sub>2</sub>SO<sub>4</sub>) 0.07%, sodium chloride (NaCl) 98.83%.

### VEE VO

*Manufacturer.*—Mayflower Food Products, Inc., New York.

*Description.*—Mixture of cane sugar, breakfast cocoa, malted milk, dried egg yolk (1 per cent), whole milk powder (0.5 per cent), dried malt (0.5 per cent) and flavored with salt and vanillin. The same as Vee Vo of the Titman Food Products, Inc., New York (THE JOURNAL, Sept. 14, 1935).

This product originally was manufactured by the Titman Food Products, Inc., and was accepted by the Council on Foods. Later it was removed from the market. The ownership of the Titman Food Products Company recently has reverted to the Mayflower Food Products, Inc. Vee Vo has been reinstated among the accepted foods of the Council.

### PARKE, DAVIS & COMPANY'S EXTRACT VANILLA SPECIAL

*Manufacturer.*—Parke, Davis & Company, Detroit.

*Description.*—Vanilla extract containing water, alcohol, sugar and extractive matter of Bourbon and Tahiti vanilla beans.

*Manufacture.*—A blend of Bourbon and Tahiti vanilla beans, commercially dried and cured, is cut into small pieces, fully extracted by maceration and percolation with 50 per cent alcohol, after which the percolate is adjusted to proper volume by the addition of sugar and water.

*Analysis* (submitted by manufacturer).—Water, by weight, 38.8%, alcohol, by weight, 30%, total solids 31.2 Gm per 100 cc, ash 0.3 Gm per 100 cc, sucrose 28.0 Gm per 100 cc, vanillin 0.18-0.19 per 100 cc, lead number (Winton) 0.35, specific gravity (approximate) 1.08.

<sup>2</sup> Gatti, G. Note e riv. di psichiat. 61:465 (Sept. Dec.) 1932.

<sup>3</sup> Fontanier. Ztschr. f. d. ges. Neurol. u. Psychiat. 152:494 1935.

<sup>4</sup> Verbiest H. Nederl. tijdschr. v. geneesk. 79:2533 (May 25) 1935.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 5, 1938

## VIRUS INFECTIONS

Knowledge of viruses and virus diseases has progressed so rapidly that reviews are out of date almost as soon as published. The clinical lecture of Thomas M. Rivers<sup>1</sup> at the Kansas City session of the American Medical Association now needs to be supplemented. Van Rooyen and Rhodes<sup>2</sup> have recently reviewed the subject. Present investigations, they say, have tended to show that the so-called filtrable and ultramicroscopic viruses represent a range of living agents that differ from the bacteria only by virtue of their minute size and their inability to multiply in cell-free mediums. This view cannot be considered final, however, since Laird and Elford in 1936 isolated from sewage a virus which was successfully cultivated in artificial mediums. Furthermore the living nature of viruses has been challenged by the work of Stanley and others, who isolated from plants affected by tobacco mosaic a crystalline protein which was capable of reproducing the disease when inoculated into other plants.

Certain viruses will grow readily in the presence of living cells, provided they are suitably supported, nourished and warmed. The use of the chick embryo for virus research, described by Burnet<sup>3</sup> in 1936, has proved an invaluable aid to investigations. It has enabled the production of vaccinal material for human vaccination from the egg which is absolutely sterile and which has the same biologic properties as lymph produced from the calf.

The serum of an individual who has passed through an attack of virus disease will show specific neutralizing and other antibodies during convalescence. During this period the previously infected person is protected from further invasion, in fact, at one time it was considered that resistance to a second attack was an essential criterion of this group of infections, but this generalization is no longer possible. The therapeutic action of

convalescent serums of measles is well known, but whereas it is of value when given early, it appears to be relatively useless when administered during the late stages of the disease.

Direct contact of the skin or mucous membrane is a common route of transmission of virus diseases, examples of which are variola, vaccinia, herpes, molluscum contagiosum, warts and venereal lymphogranuloma. In other diseases, such as measles, mumps, influenza and psittacosis, droplet infection may be the route of transmission. Many virus diseases of man are communicated through animal, insect or arthropod vectors. A number of naturally occurring virus diseases of animals have been shown to be communicable to man, such as rabies, Rift Valley fever, louping ill and foot-and-mouth disease. The incubation period between the entrance of the virus into the host and the development of signs and symptoms is a characteristic feature of virus disease, but the interval may vary greatly in duration. An extreme example is cited by van Rooyen and Rhodes, who report a case of rabies in a veterinarian six months after being licked by a rabid dog. Having gained access to the tissues of the host, a virus either may cause a generalized infection throughout the body or may exert a selective affinity for one of its tissues. The mode and rate of virus excretion is of interest to public health authorities, it is already apparent that in many instances viruses may remain for considerable periods in the tissues, and individuals harboring them may act as carriers.

Acquired immunity to certain virus infections may be obtained by immunizing either with living attenuated virus or with dead virus suspensions. The present status of attempted immunization in influenza has been referred to in a previous editorial.<sup>4</sup> The method of immunization in yellow fever, described in 1937, consisting of injecting immune human yellow fever serum, followed later by a small dose of live neurotropic virus, is earnest of further progress in this direction.

Another interesting review of the immunologic reactions of viruses has been published recently by Burnet and his co-workers.<sup>5</sup> The majority of the workers in this field, these authors say, have held that virus neutralization reactions are manifestations of virus-antibody union. Summarizing their interpretation of this reaction, they state that a virus inactivation by immune serum results primarily from union of antibody to the virus surface. This union is reversible and takes place at a rate and reaches an equilibrium determined by the ordinary laws of reversible chemical union. The union of antibody has no intrinsic inactivating effect on the virus but the inactivation is the result of the interaction between susceptible cell and antibody-coated virus particle. In practice, however, the experi-

1 Rivers, T. M. Recent Advances in the Study of Viruses and Viral Diseases. J. A. M. A. 107: 206 (July 18) 1936.

2 van Rooyen, C. E. and Rhodes, A. J. A Survey of Virus Infections. Glasgow M. J. 11: 1 (Jan.) 1938.

3 Burnet, F. M. The Use of the Developing Egg in Virus Research. Medical Research Council, Special Report Series No. 220. 1936.

4 Progress in Influenza. editorial. J. A. M. A. 109: 1272 (Oct. 9) 1937.

5 Burnet, F. M., Keogh, E. V. and Lush, Dora. The Immunity Reactions of the Filtrable Viruses. Australian J. Exper. Biol. & Med. Sci. 15: 231 (Sept.) 1937.

mental results obtained with any given virus will deviate from theoretical values due to variation in range of virus population, time required to reach equilibrium, lag between time of inoculation and initiation of a demonstrable lesion, secondary reactions, and mixtures of virus with relatively large amounts of serum

### PROTEINS OF FIRST IMPORTANCE

The extraordinary ease with which chemical transformations proceed at physiologically normal temperatures in the organism, in contrast to the difficulty involved in conducting similar reactions in the laboratory, is attributable to the existence of catalytically active agents. Although some of the changes can be directly related to the operation of physical laws, certainly the majority of the many hundreds of known bodily processes owe their amazing specificity and velocity of reaction to biocatalysts. Obviously, therefore, a clearer concept of the mechanism of the fundamental processes of metabolism which occur in every living cell and on which the life of these structural units depends can be gained from a better understanding of the substances which influence the course of these primary chemical mechanisms. Ever since investigators have concerned themselves with the chemistry of vital processes, the proteins have exercised a peculiar fascination. Not only are the proteins the fundamental building material of the cell protoplasm, but the particular group of substances which catalyze life processes are also protein in nature. Although we still lack an exact knowledge of the structure of a single protein molecule, the persistent efforts of investigators and the continued introduction of newer methods, particularly within the last decade, have opened unsuspected horizons to the vision of the investigator of proteins. Results have been secured which promise to transcend the boundaries between the living and the lifeless and which have contributed enormously to the fund of information regarding both the normal and the pathologic processes of organisms. Of particular importance in this field is the work of Northrop, Chandler medalist. His lecture delivered on the occasion of the award of the medal<sup>1</sup> presents an excellent summary of recent investigations of biocatalysts as proteins.

The chemical nature of the enzymes, the chief group of biocatalytically active substances, was quite unknown until a few years ago. The first enzyme to be isolated in crystalline form was urease, and this substance was found to be a protein. In the last decade, pepsin, trypsin, chymotrypsin, carboxypeptidase, amylase, catalase and several other enzymes have been obtained in crystalline form, and each has been shown to be a protein. It appears therefore that the characteristic and fundamental chemical reactions which occur in living cells are caused by the presence of minute amounts of certain peculiar proteins. Thus the chemical nature of enzymes

is now well established and considerable information is available regarding their mode of action. One of the most interesting phases of the study of enzymes has been the effort to determine the portion of the protein molecule responsible for the catalytic activity. In some instances it has been demonstrated that this activity can be attributed to the presence of a group which is conjugated with the protein molecule, the so-called prosthetic group. This is true, for example, in the case of the yellow respiratory ferment studied by Warburg. In the case of biocatalysts in whose structures no prosthetic group or other readily detected structure has been found to which to assign the catalytic action, it appears that the activity depends on some peculiar arrangements of the amino acid components of the protein molecule. This is probably true, for example, of pepsin. Although efforts to identify the particular arrangement or active groupings in such molecules have been unsuccessful, it has been possible to prepare several proteins which are closely related to the active enzymes but which are themselves inactive. Furthermore, careful studies of the differences between such inactive proteins and the active enzymes have demonstrated that comparatively slight changes in an inactive protein may result in the formation of the active enzyme. Under these conditions the reaction is autocatalytic, i. e., some enzymes possess the power to form themselves from inert proteins.

The phenomenon of autocatalytic production of these biocatalysts from inactive protein may be translated to the field of virus proteins, in which rapid progress has recently been made. Crystalline proteins have been isolated which, when inoculated into healthy tissue, produce pathologic growths characterized by an increased production of the catalytically active protein or virus molecule. A synthesis of new virus protein is initiated and continues to take place at the expense of the normal cell tissue. Here indeed is an astounding observation: the ability of an inert, lifeless, crystalline organic molecule to initiate what is probably an autocatalytic production of itself. Similar results have been reported by Northrop for bacteriophage. A practically homogeneous protein of huge molecular weight (approximately 200,000,000) has been isolated from lysed staphylococci culture. This protein possesses the properties of bacteriophage, being capable of increasing when inoculated into a growing culture of staphylococci and eventually causing complete dissolution of the bacteria. This protein also, in common with some of the crystalline virus proteins, possesses the property of increasing in the presence of living cells. It remains to be definitely established whether these biocatalysts produce themselves autocatalytically from a precursor present in normal cells or whether they initiate a synthesis of themselves from simpler compounds. It has been established that the biocatalysts which have been studied are proteins and that investigation of these proteins has served to eliminate certain distinctions between living

<sup>1</sup> Northrop J. H. Science 56: 479 (Nov. 26) 1937



and lifeless. As crystalline, organic compounds, these materials are lifeless, as substances which have the property of increasing in the presence of living cells, they assume a property characteristic of living things. More and more it appears that the value of adequate knowledge of the chemistry and the metabolism of proteins is necessary to an understanding of normal and pathologic processes. Truly, this group of substances richly deserves its name, proteins, which means "of first importance."

### EPILEPSY

The term "epilepsy," derived from the Greek word meaning "a seizure," connotes only the clinical manifestation. Now, after a thousand years, the acquisition of information on the underlying pathologic physiology permits an entirely new concept of this syndrome. Among the investigations responsible for this clarification, those by Gibbs and his colleagues have taken an important place. Their most recent report,<sup>1</sup> dealing with the use of the electro-encephalogram, further corroborates the view that an attack of epilepsy is associated with the development of abnormal rhythms in the cerebral cortex and is hence a paroxysmal cerebral dysrhythmia.

Seven new facts about epilepsy seem to have been gained in the past two and one-half years by means of the electro-encephalogram. An epileptic seizure is accompanied by disturbances in the normal electrical activity of the brain or, more exactly, a clinically observed seizure is merely the outward manifestation of a disordered rhythm of brain potentials. Some patients observed during seizures, however, do not show abnormality of rhythm. The explanation, the investigators believe, is that the condition of the involved portion of the brain is not being recorded. Although this interpretation seems plausible, it lacks adequate substantiation. The three main clinical types of seizure—petit mal, grand mal and psychic variant—have distinct recognizable cerebral rhythms. The abnormal rhythms are clearly the causes of those symptoms (loss of consciousness and abnormal movements of the muscles) which constitute the seizures of epilepsy. The more fundamental basis of the disorder, however, is not the abnormal rhythm but rather a defective control of the rhythm. Furthermore, the electro-encephalogram often reveals abnormalities of electrical activity which are not at the time evident by subjective or objective clinical manifestations. The picture may be of the same pattern as that found during a clinical seizure but diminished in duration and voltage. At times grand mal and psychomotor attacks may be predicted by observation of the electro-encephalogram before any clinical sign is manifest.

When the electrodes are placed at different points on the scalp, it is possible to speak with assurance

only of what takes place over the various readily accessible areas of the cortex. Abnormal rhythms commonly appear first in the frontal area but may arise first in the parietal or occipital areas. Finally, when abnormalities of rhythm are frequent, a few hours' observation is sufficient to determine whether the condition is improved or made worse by a given drug or treatment. Petit mal rhythms may be precipitated by a short period of overventilation and may dramatically disappear while the patient is breathing air containing from 3 to 7 per cent of carbon dioxide. Abnormal rhythms are also increased by insulin and decreased by dextrose. Sedative drugs have varying effects, depending on the type of abnormal rhythm.

Although this method of investigation is less than three years old, it has already contributed enormously to the understanding of the pathologic physiology of epilepsy and the differentiation of the various types by other than clinical criteria. It warrants the hope that methods of treatment can be improved by objectively observable means and portends a greater degree of individualized effective therapy.

### Current Comment

#### CANCER IN EARLY LIFE

Elsewhere in this issue (page 703) appears a study by Hall and Bagby on the frequency of cancer during the first three decades of life. Since 1908 there have been 134 patients at the Barnard Free Skin and Cancer Hospital between the ages of 8½ and 31 in whom a diagnosis of cancer was confirmed by microscopic examination. The youngest patient in the series was 8½ years old, the youngest with carcinoma of the lip, 19, of the breast, 22 (two patients), of the ovary, 15, and of the cervix, 20 years. This record strongly affirms the fact that cancer can and does occur in young persons in practically all anatomic locations. As in cancer of later life, the prognosis is intimately dependent on early diagnosis and satisfactory treatment.

#### PHYSICAL AND EMOTIONAL PERIODICITY IN WOMEN

The occurrence of a female reproductive cycle indicates a hormone periodicity that is well recognized. Nevertheless, previous to the study of McCance and his co-workers<sup>1</sup> there seems to have been no sustained attempt to obtain systematic records of the psychological and subjective and physical changes that accompany the cycle. Using a modification of the questionnaire diary method, they obtained the day-to-day records over a period of from four to six months of the physical changes and subjective phenomena of 167 normal women. The data submitted covered 780 complete menstrual cycles and in addition data from a smaller group on physical changes only. The analysis revealed

<sup>1</sup> Gibbs F. A., Gibbs E. L. and Lennox W. G. Epilepsy. A Paroxysmal Cerebral Dysrhythmia. *Brain* 60: 24 (Dec.) 1937.

<sup>1</sup> McCance R. A., Luff M. C. and Widdowson E. E. Physical and Emotional Periodicity in Women. *J. Hyg.* 37: 371 (Oct.) 1937.

an average length of menstrual cycle of 27.8 days, with a standard deviation of 3.4 days. This however was an average, and individual cycles were often characteristically short or long, regular or irregular. No woman menstruated with complete regularity (measured in days) over a period of six months. An interesting feature of the study was the notation that 23 per cent of the menstrual periods began between 7.30 and 9.30 a. m. and the average duration of flow was about 4.5 days. The periodicity for each of the subjective phenomena was averaged and recorded graphically. On this basis, fatigue showed a definite relation to the cycle, reaching an average peak at about the onset of the menstrual flow. Abdominal pain, pain in the back, mental depression and, to a lesser degree, irritability, tendency to cry, and effort required for intellectual work, were similarly related to the beginning of the cycle. The incidence of headache, however, reached a peak about the third day after the onset of the cycle rather than the first day. The graphic expression of the incidence of the breast changes showed an average incidence reaching a peak before the onset of the menstrual flow and falling rapidly thereafter. When obtained, the incidence of sexual feeling and sexual intercourse varied widely individually, but the mean showed an irregular peak in the early days of the postmenstrual period. While admittedly incomplete, and unsatisfactory in many respects, this study serves as a scientific attempt to secure accurate information of great practical importance.

DERMATOPHILIC POLIOMYELITIS

Although controversy still exists as to the method of spread of poliomyelitis, this doubt is not generally recognized by clinicians. It is apparently not generally known that monkeys can be infected with poliomyelitis virus through routes other than the nasal mucosa. For example, in 1935 Erber and Pettit<sup>1</sup> inoculated thirteen monkeys subcutaneously with a pooled virus. Twelve of their animals developed typical lethal poliomyelitis. In 1936 Levaditi and his co-workers<sup>2</sup> inoculated seventeen monkeys subcutaneously with a monovalent poliomyelitis vaccine. Ten of the inoculated monkeys developed lethal paralytic symptoms. Trask and Paul<sup>3</sup> of Yale University, Howitt<sup>4</sup> of the University of California and other American workers have reported similar cutaneous infectivities. In their latest studies of cutaneous infectivity Trask and Paul<sup>3</sup> of the Department of Pediatrics, Yale University School of Medicine, found that certain freshly isolated poliomyelitis viruses are highly infectious on intracutaneous injection but that this cutaneous infectivity is apparently lost after repeated passage through monkeys. Endermic injections with recently isolated 1934 Los Angeles virus, for example, or with freshly isolated 1937 Toronto virus, rarely fail to produce lethal paralysis. One of these dermatophilic

strains (Los Angeles 1934) is apparently not infectious on intranasal instillation. The foregoing studies and those of Toomey,<sup>6</sup> make it seem probable that clinicians have been too hasty in focusing their attention solely on the nasal mucosa as presumably the only portal of entry of this infectious disease. The Yale University pediatricians have rendered a distinct service in calling attention to other possibilities.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

**Plague Infection**—According to *Public Health Reports*, plague infection had been proved, by animal inoculation and by cultures in twenty-nine fleas from five beecheyi squirrels collected Nov. 3, 1937, in the Shaver Lake area, Fresno County.

**Society News**—The program of the February 17 meeting of the Los Angeles County Medical Association was presented by the obstetric section with the following speakers: Drs. Sterling N. Pierce, 'Accidents at Cesarean Sections', William Benbow Thompson, 'Failures of Induction of Labor', Raymond D. McBurney and Philip A. Reynolds, 'Care of Parturient Women Under Analgesia,' and George H. Kress, county hospital problems.

**Publications in Pharmacology**—It is announced that the *University of California Publications in Pharmacology* will make their appearance early in the spring. These studies will appear irregularly but will be consecutively, pagged to form volumes of about 500 pages. Each issue will contain reports of original pharmacologic studies from the university's laboratories together with occasional review and general articles relating to the science. The editors are Gordon A. Alles, Ph.D., Troy C. Daniels, Dr. Mayo H. Soley and Chauncey D. Leake, Ph.D. A sample copy of the first paper may be obtained without obligation by writing to the University of California Press, Berkeley. It is expected that a volume will be completed about every three years. The subscription price will be \$5.

COLORADO

**Society News**—Dr. Charles P. Stockdale, Tioga, discussed "The Handling of Impetigo in Rural Schools" before the Huerfano County Medical Society, January 13, and Dr. Abram F. Stanley, Walsenburg, "Rural Health Problem Under WPA Difficulties."—Dr. Gilbert E. Haggart, Boston, addressed a special meeting of the Medical Society of the City and County of Denver, January 26, under the auspices of the Rocky Mountain Orthopedic Club, on "Sciatica and Low Back Pain: Methods of Diagnosis and Treatment."

DELAWARE

**Society News**—Dr. John M. Bergland, Baltimore, read a paper before the New Castle County Medical Society in Wilmington, January 14, entitled "The Attempt to Relieve the Pain of Labor." Dr. Fred H. Albee, New York, addressed the society recently on "Bone Reconstruction Surgery." Dr. Edward T. Crossan, Philadelphia, discussed 'Acute Hematogenous Osteomyelitis' before the society in Wilmington February 15.

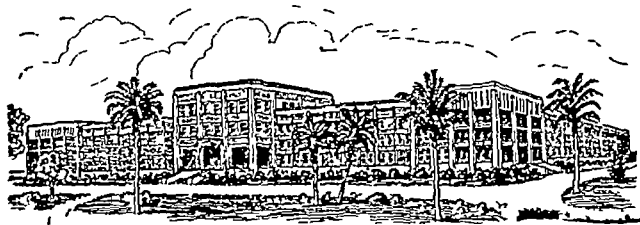
FLORIDA

**First Tuberculosis Sanatorium in Florida**—The first state tuberculosis sanatorium in Florida was opened January 3 near Orlando. Dr. Jay Arthur Myers, Minneapolis, president of the National Tuberculosis Association, was the principal speaker. Others on the program included Drs. Edward Jelks, Jacksonville, president of the Florida Medical Association, Wilmoth H. Baker, Tallahassee, state Negro tuberculosis committee, Rev. E. C. Gillette, Jacksonville. The sanatorium is a three story brick and concrete structure and located on one of the highest points adjacent to Orlando. It overlooks a lake, and

1 Erber B. and Pettit A. Comp. rend. Soc. de biol. 117 1175 1934  
2 Levaditi C. Kling C. and Harbei P. Bull. Acad. de med. 115: 411 (March 10) 1936  
3 Trask J. D. and Paul J. R. J. Bact. 31 527 (May) 1936  
4 Howitt, B. F. Science 55 268 (March 12) 1937  
Trask, J. D. and Paul J. R. Science 57 44 (Jan. 14) 1938

6 Toomey J. A. Active and Passive Immunity and Portal of Entry in Poliomyelitis J. A. M. A. 109 402 (Aug. 7) 1937

is in the center of a 160 acre tract of land donated by the city of Orlando. The sanatorium, with equipment, powerhouse, sewage disposal plant, laundry and nurses cottages, cost about \$700,000. It was financed through a state appropriation and a loan-grant from the federal emergency administration of public works. The building has single rooms and two, four and six bed wards. It is equipped to accommodate 312 patients but will house more than 400 when the state tuberculosis board has funds to purchase additional equipment. Two operating rooms are located on the third floor as well as a laboratory



Florida's first tuberculosis sanatorium

and x-ray department. One wing of the building is for 125 Negro patients, with the same facilities as those for white patients. Dr. Rollin D. Thompson, formerly medical director and superintendent of the Wisconsin State Tuberculosis Sanatorium, Statesan, Wis., is the head of the new institution.

### INDIANA

**Society News**—Dr. Lilhan R. Smith, Lansing, Mich., among others, addressed the Tippecanoe County Medical Society in Lafayette March 8 on "Summer Round-Up Program for Children."—Dr. Michael L. Mason, Chicago, addressed the Northeastern Indiana Academy of Medicine in Kendallville February 24 on "Management of Injuries to the Hand."

**Committee to Study Marriage Laws**—Governor M. Clifford Townsend recently appointed a special committee to study the Indiana marriage laws with a view to necessary revisions. The work will include a comparison of the laws of other states. Medical representatives on the committee include:

Dr. Herman M. Baker, Evansville, president, Indiana State Medical Association.  
Dr. Harold J. Norton, Columbus.  
Dr. Thurman B. Rice, Indianapolis, Indiana University School of Medicine.  
Dr. Eldridge M. Shrinklin, Hammond, editor of the state medical journal.  
Dr. Floyd R. Nicholas, Carter, South Bend, chairman, syphilis committee, state medical association.  
Dr. Arthur F. Weyerbacher, Indianapolis.  
Dr. Louis P. Harshman, Fort Wayne State School.  
Miss Marie Winkler, R.N., Indianapolis, president, state nurses association.  
Dr. George E. Denny, superintendent, Muscatatuck Colony, Butlerville.  
Senator Thomas Hendricks, Indianapolis, secretary, state medical association.

### KANSAS

**Federal Aid for Venereal Disease Control**—The Kansas State Board of Health has recently received a grant of \$2,400 from the U. S. Public Health Service to finance graduate courses among the medical profession of the state in venereal disease, tuberculosis and cancer control. These programs, which are now being organized, will be sponsored jointly by the board of health and various committees of the Kansas Medical Society.

**Society News**—Dr. Edgar Van Nuys Allen, Rochester, Minn., addressed the Shawnee County Medical Society February 7 in Topeka on hypertension.—At a meeting of the Sedgwick County Medical Society, January 18, Drs. James E. Chipps discussed "Medical Ethics," and Leslie E. Knapp and Alonzo P. Gearhart "Fractures in the Growing Age." All are from Wichita. The society was addressed February 1 by Drs. Arthur L. Ashmore and Vincent L. Scott, Wichita, on "Treatment of Empyema" and "Convulsions in Infancy and Childhood" respectively.—Dr. Wirt A. Warren, Wichita, discussed "Treatment of Chronic Arthritis" before the Reno County Medical Society January 21.

### LOUISIANA

**Personal**—Dr. Isadore Brickman has been appointed superintendent of the State Colony and Training School, Alexandria, he had been acting superintendent since the resignation of Dr. Rutledge C. Tompkins on account of ill health.

**Society News**—A symposium on bronchogenic carcinoma constituted the program of the Orleans Parish Medical Society, New Orleans, February 14, the speakers were Drs. Stanford

Chaille, Jamison, Ernest C. Samuel, Eleazar R. Bowie and Antonio Mayoral, Harold L. Kearney, Bela Halpert and Edward William Alton Ochsner.—Dr. William H. Seemann, New Orleans, was recently reelected president of the Tuberculosis and Public Health Association of Louisiana.

### MAINE

**Hospital News**—The Bingham Associates Fund sponsored a clinic at the Rumford Community Hospital, January 12, Dr. Samuel H. Proger, Boston, delivered a lecture on obesity.

**Society News**—Dr. Joelle C. Hebert, Lewiston, was chosen president of the Maine Hospital Association at its recent annual meeting, Dr. Stephen S. Brown, Portland, vice president, and Margaret A. Hebert, R.N., Gardiner, secretary.

### MARYLAND

**Public Lecture on Vitamin Deficiency**—Karl E. Mason, Ph.D., associate professor of anatomy, Vanderbilt University School of Medicine, Nashville, Tenn., delivered a public lecture in the De Lamar series in hygiene at Johns Hopkins University School of Hygiene and Public Health, February 15, his subject was "Vitamin Deficiency as Related to Reproductive Structure and Function."

**Graduate Course in Medical History**—For the first time a graduate week in medical history will be held at the Institute of the History of Medicine, Johns Hopkins University School of Medicine, Baltimore, April 18-23. The program has been arranged so that every morning one lecture on some basic subject will be given by Dr. Henry E. Sigerist, director of the institute, and members of his staff. Demonstrations will be held and the lectures will be followed by a general discussion. The afternoons will be devoted to round table seminars.

### MASSACHUSETTS

**Hospital News**—The New England Hospital for Women and Children, Boston, commemorated its seventy-fifth anniversary in December.

**Personal**—Dr. Mary R. Lakeman, Boston, has been appointed northeastern regional director for the Women's Field Army of the American Society for the Control of Cancer. Dr. Lakeman retired Dec. 1, 1937, from the Massachusetts Department of Public Health, with which she had been associated for twenty years in child and adult hygiene work.

**Society News**—The New England Pathological Society was addressed February 17, among others, by Drs. Leo Alexander, Tsung-hwa Suh and Tracy J. Putnam on "The Vascular Pattern in Various Studies with the Benzidine Stain." All are of Boston.—The Worcester District Medical Society was addressed February 9 by Drs. Walter E. Barton and Louis H. Cohen, both of Worcester, on "Advances in the Therapeutics of the Psychoses" and "Use of Metrazol in Schizophrenia" respectively.

### MICHIGAN

**Personal**—Dr. Charles H. P. G. Benning, Peoria, Ill., has been appointed district health officer of Royal Oak, a position he held prior to his appointment as school physician in Peoria.

—Dr. Don W. Gudakunst, recently appointed health commissioner of Michigan, was guest of honor at a dinner January 19 given by members of the Detroit Department of Health.

**The Dr. Max Ballin Memorial Lectures**—The fifth series of the Dr. Max Ballin Memorial Lectures, sponsored by the North End Clinic, Detroit, as a graduate teaching endeavor, will be held at the Detroit Institute of Art. This series this year will be devoted to gynecology with the following speakers:

Dr. George A. Kamperman, Detroit, Recent Trends in Gynecology, Practice, March 9.  
Dr. Irving F. Stein, Chicago, Sterility, March 16.  
Dr. Norman F. Miller, Ann Arbor, Mich., Cancer of the Female Genitourinary Tract, March 23.  
Dr. Charles Mazer, Philadelphia, Endocrinology in Gynecology, March 30.

**Society News**—Dr. Louis Fernald Foster, Bay City, secretary, state medical society, addressed the St. Clair County medical and bar associations in Port Huron January 18 on "Professional Cooperation and Advancement."—Dr. Horton R. Casparis, Nashville, Tenn., discussed mental health before the Wayne County Medical Society and the Detroit Pediatric Society at a joint meeting February 21.—The Maine Medical Society, Detroit, was addressed February 8 by Dr. Bernard Fantus, Chicago, on "Recent Advances in Therapeutics."—At a meeting of the Genesee County Medical Society in Flint February 16 Dr. Norman E. Clarke, Detroit,

spoke on "Thyroidectomy in Treatment of Heart Disease"—The Calhoun County Medical Society was addressed in Battle Creek February 1 by Dr Udo J Wile, Ann Arbor, on diagnosis and treatment of syphilis—Dr Richard H Freyberg, Ann Arbor, discussed "An Appraisal of Our Knowledge Regarding the Etiology of Rheumatoid Arthritis" before the Muskegon County Medical Society in Muskegon, February 18

**Committees Named to Coordinate Health Activities**—The creation of a committee representing various health and medical agencies and an interdepartmental committee within the state administration for the coordination of public health activities in Michigan was recently announced by Governor Murphy. The first committee's function will be to arouse the interest of communities in their health problems, secure the cooperation of professional and educational groups, especially the medical and dental professions, and bring about a close working relationship between official and nonofficial agencies. It will be made up of the following persons:

- Dr Don W Gudakunst state health commissioner
- Dr John Sundwall professor of hygiene and public health and director division of hygiene and public health University of Michigan Medical School Ann Arbor
- Dr Bernard W Carey medical director Children's Fund of Michigan Detroit
- Dr Matthew R Kinde medical director W K Kellogg Foundation Battle Creek
- Dr Ledru O Geib chairman of the preventive medicine committee of the Michigan State Medical Society Detroit
- P C Lowery DDS Detroit

## MISSISSIPPI

**Society News**—The Central Medical Society was addressed in Jackson January 4, among others by Drs Albert G Ward and Isaac C Huggins, both of Jackson, on 'Management of Patients Presenting Cardiac Symptoms' and 'Cancer of the Rectum' respectively—A recent meeting of the Winona District Medical Society in Winona was addressed by Drs William C Chaney, Memphis, Tenn, on "Practical Approach to the Problem of Food Intolerance", Thomas H Blake, Jackson, "Fracture About the Hip," and Robert E Wilson, Greenville, "Obscure Fever of Infants and Children"

## MISSOURI

**Annual Clinical Conference of Radiologists**—The annual clinical conference of midwestern radiologists was held at the Muehlebach Hotel, Kansas City, February 11. The speakers included:

- Dr Joseph E Welker Clinical Differentiation of Coronary Disease and Upper Abdominal Pathology
- Dr Edward H Skinner Evolution of Radiation Therapy for Carcinoma of the Cervix
- Dr Cecil G Leitch Clinical Analysis of Sudden Death from Cardiac Disease
- Dr Fred E Angle Clinical and Roentgenological Data in Brucellosis
- Dr Robert Lee Hoffmann Clinical and Roentgenologic Findings in Trauma of the Genito-Urinary Tract
- Dr Ferdinand C Helwig Ovarian Influence in Cancer

Other speakers participating in a symposium Friday afternoon included Henry C Tracy, PhD, Lawrence Kan, on 'Anatomy of the Breast' and Dr Nymphus Frederick Hicken, Omaha, The Visualization and Diagnosis of Breast Lesions by Means of Contrast Roentgenograms

## NEW YORK

**Warning Against Premature Use of Rabbit Serum for Pneumonia**—The advisory committee on pneumonia control of the New York State Department of Health recently adopted a resolution warning against premature general use of rabbit serum in the treatment of pneumonia. In a statement in which the resolution was made public Dr Edward S Godfrey Jr, state health commissioner, referred to recent articles in lay publications and radio announcements which he declared have by implication promoted impressions that the new serum will shortly make available effective treatment for all types of pneumonia. In its resolution the committee stated that in certain cases its use is justified, but otherwise application of the rabbit serum should be limited to clinical trial in selected hospitals where careful observations can be made, until the value, safety and limitations of the method can be more accurately defined. Dr Russell L Cecil, New York, is chairman of the advisory committee.

### New York City

**Personal**—Dr Charles E Remy superintendent of the Minneapolis General Hospital for several years has been appointed superintendent of the Knickerbocker Hospital to succeed Mr Walter Mezger, who resigned to become associate director of Michael Reese Hospital Chicago.

**Assistant Dean Appointed**—Dr John Hugh Mulholland, assistant clinical professor of surgery at New York University College of Medicine, has been appointed assistant dean. Dr Mulholland graduated from the college in 1925. The university council also announced the promotion of Dr John A Lawler Jr to be assistant clinical professor of surgery.

**Funds for Research on Chronic Disease**—An appropriation of \$66,000 has been made available by the Rockefeller Foundation to the department of hospitals for support of research on chronic diseases at the hospital now under construction on Welfare Island. Research on chronic diseases is now in progress in temporary quarters at Metropolitan Hospital and will be transferred to the new hospital as soon as possible. The subjects now being studied include rheumatoid arthritis, the role of nutrition in chronic disease, the role of cholesterol metabolism in arteriosclerosis, circulatory and respiratory functions in pulmonary emphysema, bacteriologic and immunologic factors in acute and chronic glomerulonephritis and various factors in hypertension.

**Gibbs Medal Awarded for Vitamin Research**—Robert R Williams, ScD, chemical director of the Bell Telephone Laboratories, will receive the Willard Gibbs Medal awarded by the Chicago Section of the American Chemical Society, it is announced. The medal will be presented at a meeting in Chicago April 29, honoring Dr Williams "for outstanding work in connection with the study and isolation of the beriberi vitamin." Dr Williams was born in India of American parents in 1886 and was educated at the University of Chicago. He spent several years as chemist for the Bureau of Science in Manila, P I, returning to the United States in 1915. He was a chemist in the government service in Washington until 1919, when he joined the Western Electric Company. In 1925 he was made chemical director of the telephone company laboratories. He is also a research associate at Teachers College, Columbia University, and the Carnegie Institution of Washington.

**Society News**—Drs Joseph H Globus and James F Bing addressed the New York Endocrinological Society, January 26, on 'The Pineal Body: Notes on Its Embryogenesis and Tumor Formation and Its Relation to Pubertas Praecox'—A symposium on carcinoma of the breast was presented at a meeting of the Bronx County Medical Society, January 19 by Drs Milton R Bookman, Frank E Adair and Herbert C Chase—At the annual dinner of the Faculty Association of the New York Post-Graduate Medical School and Hospital, January 29, Drs Walter T Dannreuther, George M MacKee, Clarence G Bandler and Willard C Rappley discussed graduate medical education and the control of specialization—Dr Howard W Haggard New Haven, Conn addressed the New York Academy of Medicine, February 3, on "The Conception of Cancer Before and After Johannes Muller"—Drs Arthur M Shipley, Baltimore, and William H Stewart addressed the New York chapter of the National Society for the Advancement of Gastro-Enterology, January 31, on "Some Unusual Cases of Appendicitis" and 'Cinerentgenographic Studies of the Gastro-Intestinal Tract' respectively.

## NORTH DAKOTA

**Personal**—Dr John R Pence, Minot, has recently been appointed health officer of Ward County—Dr Charles Albert Arneson, Bismarck, has been named health officer of the city—Dr Frederick Charles Lorenzen, Elgin, has been named superintendent of the North Dakota State Hospital, Jamestown—Dr Frank W Deason Grafton, recently succeeded Dr James Prentiss Aylen Grafton, as superintendent of the North Dakota State School for the Feebleminded at Grafton.

## OREGON

**Alumni Meeting**—The annual graduate session of the Alumni Association of the University of Oregon Medical School will be held in Portland March 7-9. Dr Charles P L Mathe, San Francisco, will be the guest speaker.

**Society News**—Dr John H Besson addressed the Multnomah County Medical Society Portland February 16, on 'Bilateral Uretero-Intestinal Implantation, with Cystectomy and Hysterectomy at One Operation' and Drs Thomas D Robertson and James Marr Bissonell on 'Lobar Pneumonia: Some Newer Aspects Including Typing'—Dr Goodrich C Schaffner Portland addressed the Central Willamette Medical Society Corvallis January 6 on 'Occiput Posterior and Obstetric Emergency'.

## PENNSYLVANIA

**New State Sanatorium Started**—Ground was broken February 14 for a new state sanatorium for tuberculosis near Butler in Butler County. The new hospital will be built to accommodate 500 patients, with a special wing for children. It will have twelve units, including the service plants, dormitories for employees and nurses' home. It is estimated that the project will cost about \$2,645,000 and will be finished by May 1939.

**Graduate Program at Geisinger Hospital**—The second graduate seminar of the year was presented at Geisinger Memorial Hospital, Danville, February 4, under the auspices of the Montour County Medical Society. In the morning Dr Harold L. Foss conducted an operative clinic and the following program was presented later:

Dr Roy D. McClure, Detroit: Treatment of Burns.  
Dr Wendell J. Stainsby, recently of New York, now of Danville: Chronic Arthritis.  
Dr Edward L. Bauer, Philadelphia: Rheumatic Infections.  
Dr Clyde M. Spangler, Philadelphia: Toxemias of Pregnancy.  
Dr Edward F. Roberts, New York: Pneumonia and Its Treatment with Serum.

## Philadelphia

**Medical College News**—Dr Maurice E. Binet, Vichy, France, gave a lecture February 15, at the Hahnemann Medical College and Hospital of Philadelphia, on "Hepatic Insufficiency in the Course of Chronic Colitis."—Jean Broadhurst, Ph.D., New York, gave an address at the Woman's Medical College of Pennsylvania February 18 on "Virus Inclusion Bodies in Measles and Scarlet Fever."

**New Dean of Pharmacy College**—Ivor Griffith, Sc.D., assistant dean of pharmacy and professor of theory and practice of pharmacy at the Philadelphia College of Pharmacy and Science, has been appointed dean of the college to succeed the late Charles H. LaWall. Dr Griffith, born in Wales, graduated from the Philadelphia college in 1912 and has been associated with his alma mater in various capacities for many years. He has been editor of the *American Journal of Pharmacy*, published by the college, since 1921.

**Faculty Changes at Jefferson**—Dr Karl Kornblum, assistant professor of radiology, University of Pennsylvania Graduate School of Medicine, has been appointed professor of roentgenology at Jefferson Medical College. Dr Kornblum graduated from the University of Pennsylvania School of Medicine in 1919. The following promotions in the Jefferson faculty were announced:

Dr Thaddeus L. Montgomery to be clinical professor of obstetrics.  
Dr Alexander Spencer Kaufman, associate professor of otology.  
Dr Arthur J. Wagers, assistant professor of laryngology.  
Dr Austin T. Smith, assistant professor of laryngology.  
Dr William P. Hearn, assistant professor of surgery.  
Andrew J. Ramsay, Ph.D., assistant professor of histology and embryology.

**Convicted in Charity Racket—Freed on Appeal**—Two of six men who were convicted several months ago as conspirators in a fake hospital charity drive were freed in superior court January 27, according to newspaper reports. The men were Thomas J. Goldberg, superintendent of the "Naturopathic Hospital," for which the alleged drive was conducted, and Harry S. Nurock, secretary of the Pennsylvania Society of Naturopaths (THE JOURNAL, Oct. 2, 1937, p. 1133). Judge Chester H. Rhodes said that evidence was not sufficient to show that Goldberg and Nurock were fully aware of the nature of the racket. It was said that a group of promoters proposed a dance for the benefit of the "hospital" and sold tickets by telephone. Salesmen impersonated physicians and stated that the money was to be used for victims of infantile paralysis. It was pointed out in the trial that the "Naturopathic Hospital" had no beds for patients but did have electrical and what appeared to be surgical equipment. The two men had been sentenced to two years in jail.

## Pittsburgh

**Society News**—The program of the Allegheny County Medical Society, February 15, presented the following speakers: Drs. Harvey Bartle, Philadelphia, on "Industrial Medicine"; James A. Cowan, Jr., "The Technique of the Formation of the Tubed Flap and Its Utilization"; Howard G. Schleiter and Arthur B. Thomas, "Syphilis and the Circulatory Apparatus"; and Robert C. Grauer, "Clinical Counterparts of Experimental Breast Tumors."—Dr William J. Engel, Cleveland, addressed the Pittsburgh Urological Association, February 14, on "Management of Papillary Tumors of the Bladder."—A panel discussion of health problems of school children made up the program of the Pittsburgh Pediatric Society February 11; the

speakers were Drs. Theodore O. Elterich, Harry B. Burn, Henry J. Benz, Russell R. Jones, John Watson Harmeier and Henry T. Price, and Mr. J. F. Guy, associate superintendent of the Pittsburgh public schools.

## SOUTH CAROLINA

**District Meeting**—A meeting of the Second District Medical Society was held at Batesburg, February 17, with the following speakers: Drs. James C. McLeod, Florence, on "Traumatic Abdominal Injury"; Richard B. Josev, Columbia, "Appetite in Children"; and Herbert M. Smith, Columbia, "The Physician and the State Board of Health." Dr. Leonidas M. Stokes, Walterboro, president of the South Carolina Medical Association, also made an address.

**Cancer Symposium**—The Tri-County Hospital at Orangeburg opened a cancer service with a symposium at which Dr. Ira I. Kaplan, New York, and Kenneth M. Lynch, Charleston, were the guests January 17. Both speakers addressed a public meeting, and a clinic was held in the hospital. Following a banquet at the Eutaw Hotel, Dr. Kaplan spoke on treatment of cancer by a combination of surgery, x-rays and radium and Dr. Lynch on pathogenesis of cancer.

**Society News**—Dr. Chevalier L. Jackson, Philadelphia, addressed the Columbia Medical Society of Richmond County, Columbia, February 14, on "Foreign Body in the Air and Food Passages." Dr. Reginald Fitz, Boston, addressed the society January 10 on "Problems in Modern Diabetic Therapy," and Dr. Orlando B. Mayer, Columbia, on "Pancreatic Hemorrhage Followed by Fistula."—Dr. Leonidas M. Stokes, Walterboro, president of the South Carolina Medical Association, addressed the Edisto Medical Society (Hamberg, Calhoun and Orangeburg counties) January 27 on "The Physician as a Citizen."

## TEXAS

**Tenth Dallas Clinical Conference**—The tenth annual spring clinical conference of the Dallas Southern Clinical Society will be held at the Hotel Adolphus, Dallas, March 14-17. There will be a general assembly each morning, followed after the first day by postgraduate courses. In the afternoons there will be clinics at the hotel and in the evening different types of meetings. Guest speakers and their subjects at the general assemblies will be:

Dr. Nelse F. Ockerblad, Kansas City: Mo. Urology for the General Practitioner.  
Dr. Jennings C. Litzberg, Minneapolis: Treatment of Abortion.  
Dr. Conrad Berens, New York: The Role of Physician and Surgeon in the Diagnosis and Treatment of Eye Disease.  
Dr. Russell L. Haden, Cleveland: Treatment of Arthritis.  
Dr. Charles H. Best, Toronto: The Prolongation of Insulin Action.  
Dr. James C. White, Boston: Progress in Surgery of the Autonomic Nervous System.  
Dr. Henry F. Helmholtz, Rochester, Minn.: Urinary Infections in Children.  
Dr. Allen O. Whipple, New York: Treatment of Carcinoma of the Stomach.  
Dr. Warren T. Vaughan, Richmond, Va.: Modern Methods in the Treatment of Migraine.  
Dr. Philip H. Kreuscher, Chicago: Fractures of the Hip and Other Major Joints.  
Dr. Howard T. Karsner, Cleveland: Research on Hypertension.  
Dr. George W. Mackenzie, Philadelphia: The Appearance and Disappearance of the Normal Drumhead.

Monday evening Dr. Berens will speak on "Medical Economics", a clinical-pathologic conference will be held Tuesday evening, symposiums on nutritional deficiencies, malignant disease and allergic rhinitis, Wednesday evening, and the annual clinic dinner Thursday evening. Other symposiums will be presented at the afternoon meetings on sulfanilamide, pancreatic disease and backache. In addition there will be luncheon conferences with the guest speakers each day.

## WASHINGTON

**Society News**—Drs. Donald V. Trueblood and Brian T. King, Seattle, addressed the Grays Harbor County Medical Society, Aberdeen, January 19, on "Tumors of the Neck and the Parotid Gland" and "Congenital Sinuses and Anomalies of the Head and Neck" respectively.—Dr. James Marr, Walla Walla, Portland, Ore., addressed the Walla Walla Valley Medical Society, Walla Walla, January 13, on "Differential Diagnosis of Chest Diseases."—At a meeting of the Yakima Valley Medical Society, Yakima, January 10, Dr. George F. Crow, San Francisco, spoke on "Treatment of Pneumonia with Serum."—Drs. Frederick B. Exner and Frank I. Horvath, Seattle, addressed the King County Medical Society, Seattle, February 21 on "Enlarged Thymus and Diverticula of the Colon" respectively.

## WISCONSIN

**William Snow Miller Lecture**—Dr Herbert S Gasser, director of the Rockefeller Institute for Medical Research, New York, will deliver the eleventh William Snow Miller Lecture, March 8, at the Service Memorial Institute Building, University of Wisconsin, Madison. The lecture is presented under the auspices of the Phi Beta Pi Medical Fraternity and the University of Wisconsin Medical Society. Dr Gasser's topic will be "The History of Electrophysiology." Dr Miller's eightieth birthday will occur March 29.

**Conference of County Secretaries**—The annual conference of secretaries of county medical societies was held in Milwaukee January 9 with Dr Samuel L Henke, Eau Claire, as chairman. Among the subjects discussed were work of the special committees of the state society to study distribution of sickness care and hospital insurance, programs for county medical societies and malpractice insurance. Mr J George Crownhart, Madison, executive secretary of the state society, presented a report on medical care for the clients of the Farm Security Administration.

## WYOMING

**New State Board Ruling**—The Wyoming State Board of Medical Examiners recently adopted a resolution ruling that a physician who opens an office alone or associates himself with another physician before he obtains a license shall not be permitted to appear as an applicant for a license. It is considered that a man who thus attempts to practice has violated the medical practice act and is therefore not eligible to appear before the board as an applicant of good moral character.

## PUERTO RICO

**News of the School of Tropical Medicine**—George W Bachman, Ph D, director of the School of Tropical Medicine of the University of Puerto Rico in San Juan under the auspices of Columbia University, in his annual report stated that a study of the peasant diet has centered during the past year on the chemical composition, vitamin A content, ash analysis and protein adequacy of the island's forage crops. This research is carried on as a joint project with the agricultural experiment station. In cooperation with the Puerto Rico Reconstruction Administration a handbook on nutrition is being prepared. Health and socio-economic conditions in the island's sugar region are being studied by the department of bacteriology and the health division of the reconstruction administration. Dr Bachman stressed the need of an endowment for the school.—Robert M Yerkes, Ph D, director of the laboratories of primate biology, Yale University, New Haven, Conn, lectured at the school of tropical medicine recently on "Morphine Addiction in the Clumpazee." Dr Donald S Martin, Durham, N C, is spending the winter working in the department of mycology and dermatology. H D Tate of the Bureau of Animal Industry, Washington, D C, is studying the problem of tick eradication.

## GENERAL

**National Research Council Chairman**—Dr Ross G Harrison, Sterling professor of biology, Yale University School of Medicine, New Haven, Conn, has been elected chairman of the National Research Council. He succeeds Dr Ludvig Hektoen, who has become executive director of the National Advisory Cancer Council of the U S Public Health Service.

**Grants Available for Research in Child Neurology**—The council of Child Neurology Research, a fund set up in 1936 by the Friedsam Foundation, announces that applications for grants will be considered at the meetings to be held in April and October of each year. The purpose of the council is to encourage original research on definite problems coming within the scope of child neurology and allied fields. Applications must be in the hands of the director, Dr Bernard Sachs, 116 West Fifty-Ninth Street, New York, before April 1 and September 15. The applicant must state distinctly the problem under investigation and the methods to be pursued.

**Gorter Conference in Washington**—The third International Gorter Conference will be held in Washington D C, September 12-14. Physicians and others in the United States and other countries desirous of participating in the program are requested to submit titles at their earliest convenience. Subjects proposed for discussion are endemic gorter cretinism and myxedema, the thyroid in relation to metabolism, nutrition and endocrine glands and hyperthyroidism. The official

language of the conference will be English, and interpreters will be furnished for papers read in other languages. For further information address officers of the American Association for the Study of Gorter or the chairman of the program committee. The secretary of the association is Dr William Blair Mosser, Kane, Pa., and the program chairman is Dr Allen Graham, 2020 East Ninety-Third Street, Cleveland.

**Eye Swindler Attempts Suicide**—Ernest Mandell, one of a group of itinerant eye swindlers, pleaded guilty in federal court in Milwaukee January 12 to a charge of using the mails to defraud and was sentenced to serve thirty days in the house of correction. He was arrested at Nashville, Tenn, accused of defrauding a couple in Ripon, Wis, of \$1,400 for "eye treatments" in 1933. Mandell attempted to commit suicide in jail, it is reported. A news item in THE JOURNAL, March 17, 1934, page 849, reported the arrest of an E J Mandell in Kentucky on a similar charge. For want of proof he was released with his companion at that time on condition that the \$300 involved be refunded. Frank Faircloth, alias Frank Nelson, pleaded guilty to the same charge in Milwaukee, January 12, and was sentenced to four months in the house of correction. An indictment is pending against Mandell in Greene County, Pa, in connection with a swindle near Jefferson, and one against Faircloth in Mississippi. A roundup of these itinerant eye swindlers has been under way for some months by the U S Post Office Department.

**Government Appeals from Decision Reversing Baker's Conviction**—The government has appealed to the supreme court in its case against Norman Baker, "cancer specialist," and E B Rood, charged with violating the federal communications act in connection with broadcasts from Station XENT, Nuevo Laredo, Mexico. A petition charged them with making mechanical reproductions of voices and music at Laredo, Texas, which were shipped to the radio station and broadcast. It stated that no permit had been obtained from the Federal Communications Commission. The government appealed from a decision of the fifth circuit court of appeals in December 1937 which reversed the conviction of the two men in the United States District Court for the Southern District of Texas, April 22, 1937. At that time Judge Thomas M Kennerly sentenced Baker to spend four months in jail and pay a fine of \$2,000 to the United States of America "for conspiracy to locate, maintain and use apparatus from which and whereby sound waves are and were converted into mechanical and physical reproductions of sound waves and to carry, transport and deliver to a radio broadcast station in a foreign country for the purpose of being broadcast from that station and which said station was so located geographically that its emissions were received consistently in the United States, without first obtaining a permit from the Federal Communications Commission." Rood received a sentence of four months in jail and a fine of \$500 and a third defendant, Roy Richardson, one day in jail. The reversal of the conviction was obtained on the ground that section 325 B of the federal communications act of 1924 did not apply to the manufacture and shipment of phonograph records. Baker operated a radio station in Muscatine, Iowa, but in 1931 the federal commission refused to renew his license. He operates a hospital in Muscatine and recently opened the Baker Hospital in Eureka Springs, Ark, it is reported.

## FOREIGN

**International Neurological Congress**—The third International Neurological Congress will be held at Copenhagen, Denmark, in August 1939. Honorary presidents are Drs Bernard Sachs, New York, Gordon M Holmes, London, and Sir Charles S Sherrington, Oxford. Dr Henry Alsop Riley, New York, is among the vice presidents for the United States.

**Sixteenth Physiological Congress**—The management of the sixteenth International Physiological Congress, to be held in Zurich, Switzerland, August 14-19, announces that April 1 is the final date for notification by persons who wish to appear on the program. It also states that each lecturer or demonstrator is requested to send a short summary of his communication by June 1 to be included in a volume issued to each member of the congress. There will be six main sections of the congress: general and comparative physiology, biophysics, biochemistry, applied physiology, especially nutrition of the people, work, sport and aviation physiology, experimental psychology, including the relation between physical and somatic functions and pharmacology. Further information may be obtained from Prof E Rothlin, 6, Sonnenweg, Basle, Switzerland.



## Foreign Letters

## LONDON

(From Our Regular Correspondent)

Feb 5, 1933

## The Osteopaths and State Registration

At a meeting of the British Medical Association a discussion on "The Osteopath and State Registration" was opened by Dr Charles Hill, deputy secretary of the association, who said that the modern osteopath had certainly diluted the doctrines of Still and that all seeking medical registration should satisfy the minimum requirements of the General Medical Council and then proceed in whatever direction they liked.

Dr N J Macdonald, a physician and also a doctor of osteopathy, said that the British Osteopathic Association, whose members numbered between seventy and eighty, had formed a college committee which was trying to arrange for an establishment in London where students would be trained in medicine and surgery plus osteopathy. It could not succeed without the assistance of the medical profession, which he hoped would not be withheld. A voluntary register of osteopaths had also been set up. It comprised persons who practiced a particular form of treatment in much the same way as the holders of the diploma of medical radiology and electrology were registered. It could be made to serve as a liaison between the medical profession and the osteopaths.

Sir Ernest Graham Little, dermatologist and member of parliament, said that the chief reason for the failure of the osteopaths' bill was that the British osteopathic school proved thoroughly unsatisfactory on investigation. The American Medical Association placed the schools of osteopathy below its third or lowest class. Was the projected school in this country to be comparable to the medical schools? The difficulties were so great that they would do better to enlist the support of the existing medical schools, which he thought would be willing to institute osteopathic courses.

Sir Walter Langdon-Brown said that he was shocked to read in the evidence at the inquiry into the osteopaths' demand for registration that they contended that such diseases as typhoid could occur only where there was an "osteopathic lesion." At the same time he thought that in some respects osteopathy had made out its claim as a method of treatment. But as regards registration things should be left as they were. When a man passed the test of the General Medical Council he could adopt any theory he liked.

Dr Hill said in reply that there seemed to be almost complete unanimity as to the undesirability of state registration of osteopaths. A prominent osteopath denied the germ theory of disease and opposed the administration of insulin in diabetes, saying that the "osteopathic lesion" was the almost exclusive cause of disease. The osteopath who had been taught from the beginning that a particular mode of treatment was indicated in many or most cases and that drugs were useless could not approach the problem of diagnosis with the necessary impartiality. The osteopath had something to contribute to general methods of treatment, but he should renounce Still.

The meeting was opposed to the registration of osteopaths but the tolerance shown for methods with such an unscientific and even fantastic basis seems extraordinary. The important persons who took part in the discussion seem to have overlooked the possible explanation of the alleged good results from the treatment by suggestion or other extraneous circumstances. Tolerance is one of the great characteristics of the English but, like other good qualities, it can be carried too far and here might be described as flabbiness.

**Leprosy Conference in Cairo**—The fourth International Leprosy Conference will be held in Cairo, Egypt, March 21-31, under the auspices of the International Leprosy Association. The following delegation will represent the United States: Drs Hermon E Hasseltine, Carville, La, chairman, Victor G Heiser, New York, president of the International Leprosy Association, Herbert W Wade, Culion, P I, medical director, Leonard Wood Memorial (American Leprosy Foundation) and editor of the *International Journal of Leprosy*, Jose Rodriguez of the Philippine Health Service, Manila, P I, James A Doull, Cleveland, George M Saunders, director of the epidemiological department, Leonard Wood Memorial, Mr Perry Burgess, New York, president, Leonard Wood Memorial, and Mr Emory Ross, general secretary, American Mission to Lepers. The group sailed on the S S Exeter March 1.

## Deaths in Other Countries

Sir Frederic Truby King, former director of child welfare for New Zealand and founder of the Plunket Society for child and maternal welfare, died in Wellington February 9, aged 79.—Sir James Crichton-Browne, noted neurologist, Lord Chancellor's Visitor in Lunacy from 1875 to 1922, died at his home in Dumfries, Scotland, January 31, aged 97.—Sir Thomas Stanton, chief medical adviser to the government on tropical diseases, died in London January 25, aged 62.

## CORRECTION

**Graduate Medical Education Michigan**—According to data made available at the Annual Congress on Medical Education and Licensure, February 15, there were 318, not 332, physicians enrolled for the intramural review courses at the University of Michigan Medical School and Wayne University College of Medicine and 1,497, not 1,235, practicing physicians of Michigan registered for graduate instruction in 1936-1937, as stated in the Organization Section of THE JOURNAL, February 5, page 73B.

## Government Services

## Promotions to Rear Admirals

Dr Perceval S Rossiter, surgeon general of the U S Navy, and Capt Harold Wellington Smith, in charge of the Naval Medical School, Washington, D C, have been promoted to the rank of rear admiral in the naval medical corps. Surgeon General Rossiter has held this rank on a temporary appointment since 1933. He is a native of Shepherdstown, W Va, and graduated at the University of Maryland School of Medicine, Baltimore, in 1895. Captain Smith graduated at the Harvard University Medical School, Boston, in 1901.

## Pathologists Wanted at National Institute

The U S Civil Service Commission announces open competitive examinations for positions at the National Institute of Health as medical pathologist (research) at \$3,800 a year and associate medical pathologist (research) at \$3,200. Applicants must have graduated from class A medical schools and served one year of internship. For the first position applicants must have been graduated since Dec 31, 1916, and for the second since Dec 31, 1929. Applicants for the position of medical pathologist must have had at least three years and those for the position of associate at least eighteen months of (a) graduate study in pathologic anatomy in an institution or department offering regular graduate courses in pathology or (b) graduate experience in pathologic anatomy and histology, or a combination of these requirements. Age limits are 53 and 45, respectively, for the two positions. Applications must be on file with the commission at Washington, D C, not later than March 21 or March 24 if received from the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. The necessary forms may be obtained from the board of civil service examiners at any first class postoffice, from the commission in Washington or from district offices of the commission in Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St Louis, St Paul, San Francisco, Honolulu, Balboa Heights, Canal Zone and San Juan, Puerto Rico.



### "Nature" Barred in Germany

The German ministry of education has excluded the English scientific weekly *Nature* from general use in scientific libraries on the ground that it has contained attacks on German science and the government. Arrangements can still be made, however, for the secret use of the journal with restricted access. Commenting on this, *Nature* says that it welcomes the opportunity of recording worthy additions to science from any country or race "but should be false to the traditions of science if we failed to condemn any influence which would make scientific research subservient to political or theological domination."

### Gas Masks Stored in Nitrogen

The government's stock of gas masks for the civilian population now amounts to 26,000,000 and they are being produced at the rate of 650,000 a week. More than 9,000,000 are at present stored in the London area. There is little doubt that the production is greater than that of any other country. To ensure that this great stock shall not deteriorate but remain fully effective, they are stored in special depots under careful conditions. The face piece is stored in nitrogen at a concentration of two atmospheres. For these reasons it is not possible to distribute the masks to the people at present. They are now stored in big regional depots, but it is contemplated that each local authority shall provide storage for those required in its area. It is essential that plans should be made for quick distribution of the masks in time of emergency. It is therefore contemplated that there should be storage depots holding about 30,000 masks each.

### An Allergen Filter for Asthmatic Persons

At the Royal Society of Medicine, Dr. E. Fraenkel described a type of gas mask which he devised in collaboration with the engineers of a German manufacturer of gas masks, working in conjunction with a ventilating fan, for the use of persons who suffer from asthma. Thirty liters of air per minute can be drawn through the filter, but the quantity can be regulated. The filter is impermeable to pyridine, capionic acid, skatole, tobacco smoke, ammonia, chlorine and phosgene, and atomization with microbes such as *B. coli* and *B. prodigiosus* showed that it retained 97 per cent of them. Dr. Fraenkel recommended the use of the filter in certain trades and against climatic factors such as dust and pollens. But its chief value seems to be in treating asthmatic patients when ordinary treatment, even under hospital conditions with frequent injections of epinephrine, fails and yet the patients are much improved after two or three days' protection in a cubicle. It has also been found that protection for part of a day over a period of some weeks has an after-effect resembling desensitization. It is suggested that this is due to an intake of allergens too small to cause an attack but sufficient to desensitize.

### Sir James Crichton-Browne

Sir James Crichton-Browne, F.R.S., the pioneer of neuropathology in this country and for years a leading psychiatrist, has died at the age of 97. Educated at Edinburgh University, where he graduated in 1862, he at once showed a bent for mental diseases by taking appointments at psychopathic hospitals. He became famous by his "West Riding Reports," which emanated from the Wakefield Asylum, Yorkshire. These have become psychiatric classics and their importance in neuropathology was so great that they paved the way for the pioneer work of the neurologists Ferrier, Hughlings Jackson and Horsley. With the two former he joined in the foundation of the British neurologic journal *Bram*. He was one of the earliest advocates of the early treatment of threatened mental breakdown. Well read in literature and a gifted orator,

he was for two generations a great figure in public and professional life. He pointed out that a study of childhood afforded the best key to the interpretation of early mental disease.

### PARIS

(From Our Regular Correspondent)

Feb. 6, 1938

### Nucleosides and the Circulatory System

At the January 18 meeting of the Académie de médecine of Paris a review of the hormones and vitamins was given by Professor Pouchet of Paris. The study of their composition has been followed by a synthesis of some of the various hormones and vitamins. It was soon found that there existed an intimate interrelation between them. The terms hormones and vitamins have been applied in the past to many extracts of certain organs which are probably simple end products representing disintegration of living cells. The term parahormones was applied to these results of cell metabolism as early as 1911. It has been noticed that the products of disintegration of the albuminoids were capable at different stages of their evolution of exercising a pharmacodynamic action which could be utilized therapeutically. The nucleosides can combine with 1, 2 or 3 molecules of phosphoric acid to form nucleic acids. The latter in turn can be hydrolyzed and, among their products of disintegration, yeast nucleic acid and adenilic acid have been found to be factors in the function of the myocardium, hence their use clinically is indicated in cases of cardiac dysfunction. Yeast nucleic acid has been found in infusions of yeast, blood, urine and pancreas and adenilic acid in those of striated muscle, heart, brain, kidneys and liver. Adenilic acid and especially yeast nucleic acid are active vasodilators. They appear to lessen the work of the heart from a hydraulic point of view. At the same time they regulate cardiac contraction in regularizing the vagosympathetic tonus. The action of adenilic acid and yeast nucleic acid is only transitory but they do not have either a toxic or a cumulative effect on the heart muscle and therefore can be employed indefinitely.

### French Congress of Hygiene

The twenty-fourth annual Congress of Hygiene was held Oct. 25-27, 1937, at the Pasteur Institute of Paris. The first symposium was on School Hygiene. In a paper on "Fatigue of School Children," Dr. C. Launay of Paris said that some children present evidence of both physical and mental exhaustion. The former may be the result of adenoids or a primary tuberculous infection, which should be detected by routine medical school inspection. Mental fatigue is usually the result of too many hours in the school room. In the primary schools, at the age of 6 years, the children are obliged to be in classes from five to seven hours a day, each class being of one and a half hours' duration. Only half an hour a week has heretofore been devoted to physical education. In the grammar grades the schedule calls for twenty to twenty-six hours a week in the school room, and in the high school years this rises to from forty-five to fifty hours. Only one or two hours a week is allowed for physical education and this is seldom supervised. Children of poor parents are often obliged to aid in arduous household duties, which causes them to come to school greatly fatigued. The only remedy is to shorten the number of hours in class and devote more time to physical education.

In the second paper, Dr. Armand-Dehille called attention to open air schools. The children were in far better mental and physical condition than those in the ordinary school environment.

The causes of lack of adaptation of children in the older classes was the subject of a paper by Drs. Heuyer and de

Lepinay, based on the study of 300 children and adolescents who had been referred to them for psychologic tests because of failure to keep up their school work. In the majority of cases the lack of adaptation was the result of intellectual insufficiency. Some showed mental defects on being subjected to psychologic tests, yet the parents insisted on having the children work for a degree of bachelor of arts, which is given at a much earlier age here than in the United States. Some of those examined showed evidence of a lack of mental equilibrium and inability to concentrate, of such a marked degree that they should never have been permitted to continue their higher studies. The authors strongly emphasized the necessity of examinations by psychologists of all backward children at the end of the primary school years.

Dr G. Dreyfus-See read a paper on prevention of tuberculosis in schools. A source of infection which it is necessary to eliminate is that of tuberculosis in the teaching personnel, who should be subjected to obligatory annual physical and radiologic examinations. Children who are nonallergic ought to be sent to preventorium and not be exposed to infection during a period when they are very susceptible. A tuberculin subcutaneous test of all children ought to be made at the beginning of every school year.

In one of the large departments (counties) of western France a radioscopic examination of children in all the rural schools is made with the aid of a portable outfit, according to a paper read by Dr Jullien. The value of such radioscopic examinations of school children was confirmed by others who took part in the symposium. One of these papers, on the results obtained in the examination of more than 57,000 children in the department of the Moselle, was of special interest. During the school year 1936-1937 tuberculin cutaneous tests were made on 6,525 children from 6 to 14 years of age. The average of positive reactions was 20.8 per cent. Radioscopic examination was carried out in 1,360 children with such a positive cutaneous reaction. Only 13 per cent showed a normal pulmonary condition. The remainder showed evidence of healed, suggestive or active lesions.

#### Physical Education in French Schools

Persons in charge of public schools here have at last awakened to the necessity of the introduction of more time for sports in the daily curriculum. Until recently, French school children were obliged to attend classes for eight or ten hours a day, so that when they reached the age of 10 to 13 years their physical condition was below that of children in the majority of civilized countries. Up to 1936 the minimum number of class hours per week in the primary grades was thirty, only two hours being devoted to physical education. In many classes no facilities, such as ample playgrounds, existed for carrying out exercises. The result was that mental fatigue was common, owing to the many hours needed for school work with little, if any, allowance for play. During 1936 Mr Jean Zay, minister of public instruction, made a trial in three of the ninety departments of a plan by which the schedule was to be so arranged that more time should be devoted to physical education. The plan has been so successful that during the school year 1937-1938 it will be followed in twenty-nine departments. One afternoon each week, three hours is devoted to physical education and sports. A second afternoon of every week will include walks, visits to historic sites, gardening and manual training.

The Teachers' Federation has expressed itself as enthusiastic over the results of the experiment as applied to school children below the age of 14 years, so that the plan will soon be made obligatory for all the departments in France. Some additional advantage of this plan are that more attention will be paid in

the future to more rigid medical inspection of the children, as well as to more ample provision for swimming pools, showers and more widespread use of lunchrooms in the public schools.

#### BERLIN

(From Our Regular Correspondent)

Jan 10, 1938

#### Serotherapy of Pneumonia

At the Berlin Medical Society recently the problem of serotherapy of pneumonia was thoroughly discussed. The first speaker was Professor Neufeld, former president of the Robert Koch Infectious Diseases Institute. Reviewing the theoretical bases of serotherapy he stated that animal experimentation was of prime importance for the study of a specific substance. The circumstances which govern pneumonias differ from those of a disease such as diphtheria, for example, wherein as a consequence of the quantitatively constant toxin-antitoxin equilibrium the experimental conditions are always substantially the same. In pneumonia, on the contrary, any one of thirty odd strains of pneumococci may be the pathogenic agent. Accordingly one has no right to speak of "the" antipneumococcus serum. The efficacy of obtainable pneumococcus serums varies greatly according to the strain of micro organisms involved. For example, the white mouse can be immunized with absolute certainty against type I, whereas the serum of type III must still be considered of little value. The type I pneumococcus represents by far the most common agent of pneumonia in man, type III, although it has been proved extremely pathogenic, is much less frequently encountered. Type III is found chiefly in older and more debilitated persons, whereas types I and II are mostly observed in youthful subjects, of robust constitution. The great difficulties which formerly beset the determination of the guilty strain in a case of pneumonia have been lessened and even entirely obviated by Neufeld's discovery of the "swelling" reaction of pneumococci to specific serums. When pneumococci in sputum are mixed with specific immune serum, there occurs in addition to agglutination a swelling of the peripheral zones of the organisms to double their former size. So precise is the specificity of this capsular swelling that it makes possible the identification of the pathogenic strain within a matter of minutes. The Neufeld reaction represents a great practical advance in the serotherapy of pneumonia. As to the curative effects of the serums, favorable outcome depends largely on the stage of the disease at the time of administration, the later the inoculation, the greater the amount of serum required. In America, highly concentrated serums are utilized to minimize the dangers inherent in inoculation with massive quantities. Intravenous injection has been proved by careful testing to be the suitable method of administration.

If pneumococci are detectable in the blood, the disease will run a severe course and repeated injections of serum will be required. However, in pneumonia the constitutional factors loom larger than the presence of pneumococci. In 50 per cent of otherwise healthy pneumonia patients, pneumococci of various strains can be cultured out of the blood. Exogenous harmful influences such as catching cold, overwork and disturbances of nutrition must be present before the microorganisms become pathogenic. If pneumonia is manifested the specific antibodies represent the special defense mechanism at the command of the organism.

Dr Nissen of Copenhagen reported his own observations on the clinical serotherapy of lobar pneumonia. The improvement in diagnoses made possible by the Neufeld reaction test has proved in the Scandinavian countries an impetus to greater utilization of serotherapy. Pneumonia is particularly prevalent in northern Europe, in Copenhagen, for example the mortality of this disease amounts to 42 per cent. Nissen's adminis-

of serum to 193 pneumonia patients elicited good results. After the specific strain had been determined and, if possible, within twenty-four hours of the onset, he administered some 40,000 units, usually by intravenous injections. The patients were first tested for possible anaphylaxis. The serum was generally well tolerated. Apart from mild serum sickness, occasionally observed (in 5 per cent), no accessory phenomena were noted. Only in the presence of severe circulatory debility did intravenous administration appear contraindicated. The favorable results elicited by serotherapy are far superior to the results of all other specific curative methods. Success will be achieved, however, only if typing has been carefully done and a sufficient quantity of concentrated serum has been used. Some 50 per cent of Nissen's cases were infected with type I, these represented chiefly patients in the younger age groups. The second largest number (11.5 per cent) were infected with type III and a still smaller number (9.4 per cent) presented type VII. Following inoculation, the clinical course was usually characterized by a marked drop in temperature and above all by a substantial amelioration of the subjective symptoms. High fever is no contraindication of serotherapy.

The exact differentiation of strains was possible in 80 per cent of Nissen's cases by Neufeld's reaction of the sputum. The importance of typing becomes obvious if one compares the favorable results elicited today, with the generally unfavorable results of older serotherapeutic procedures. Certain forms of bronchopneumonia are still refractive to any known type-specific serums. Recently Nissen has begun experimentation with rabbit serum. The use of this substance, he says, has two advantages: economy and the prevention of allergic accessory manifestations. The Danes, having found the favorable results of serotherapy to be so dependent on correct pneumococcus typing, have made the Neufeld test the work of their bacteriologic institutes. These stations also keep on hand adequate stores of serum.

#### Statistics on Accidental Death

With the increase in traffic, the number of accidental fatalities has mounted. This trend, first discernible in 1933, was still in full swing in the middle of 1937. According to provisional statistics for German communities of 15,000 or more inhabitants, the accident death rate per hundred thousand of population rose from 25 in the year 1933 to 30 in the year 1936. Final figures for 1935 are now complete. In that year a total of 27,783 persons lost their lives through accidents. This number represented an increase of 8.9 per cent over 1934, which latter year showed a 12.2 per cent increase over 1933. Of the accident victims in 1935, 73 per cent were male and 27 per cent female. Traffic accidents were responsible for the largest number of fatalities. Second in importance were fatal accidents related to some peculiar meteorological condition, for example, as the result of a particularly hot summer there were 2,914 drownings in 1935 against 2,582 in 1934. The same factor underlies a more than threefold increase in fatal cases of heat stroke and sunstroke (eighty-three fatalities in 1934 and 255 in 1935). There were also more deaths from lightning (108 in 1934 and 133 in 1935) and from freezing (sixty-one in 1934 and eighty-eight in 1935).

Traffic accidents, especially those which involve the automobile continued to assume greater importance. In 1935, 48.3 per cent of fatal traffic accidents involved automobiles, 19.6 per cent motorcycles, 10.5 per cent other motor vehicles, 9.8 per cent trains, 2.6 per cent aircraft and 0.1 per cent boats. There were 10,014 fatalities from traffic accidents, one third of all accidental deaths. In contrast to the foregoing data the death rate from murders and other homicides declined again in 1935: there were 854 homicides reported (479 male victims, 375 female victims) as against 928 homicides reported in 1934 (531 male victims, 397 female victims).

#### ITALY

(From Our Regular Correspondent)

Jan 22, 1938

#### National Congress of Surgery

The Italian Society of Surgery held its forty-fourth congress at Turin under the presidency of Professor Alessandri of the Rome Surgical Clinic.

##### LATE RESULTS OF OPERATIONS FOR GASTRODUODENAL ULCER

Professor Uffreduzzi of Turin was the principal speaker on late results of operations for gastroduodenal ulcer, his collaborators were Dr Mairano, Dr Stoppani and Dr Foa. The true etiology and nature of the condition are still problematic. In any event, operation is not always followed by favorable results and every surgeon is aware that a certain proportion of patients will present postoperative symptoms indicative of a persistence of the lesion. Uffreduzzi differentiates several types of late postoperative manifestations. Subsequent examination of patients who had undergone gastro-enterostomies in his own service disclosed about 4 per cent who still presented symptoms referable to a persistence of the primitive ulcer. This percentage is decidedly lower than analogous figures reported by other surgeons. The author's follow-up observations of patients who had undergone gastro-entero anastomosis disclosed about 5 per cent affected with hemorrhages. Similar follow-ups conducted by Alessandri revealed malignant degenerative processes in 2.1 per cent of the patients. Under similar circumstances, Balfour reported the same observation in 6 per cent of his patients. The most serious complication of palliative intervention is the unexpected appearance of a new ulcer at the site of the neostomy or seated on the jejunal mucosa. The incidence of postoperative recidivation of the last named type has been placed by Lewisohn at 34 per cent. Uffreduzzi, although he believes this figure to be too high, admits that the complication is more frequent than it was formerly believed to be. Moreover, the secondary ulcer often leads to further complications, and cases have been seen in which perforation or cancerous degeneration followed its formation. A most prominent sequel of intervention in cases of gastroduodenal ulcer is gastritis, frequently accompanied by modifications in the normal gastro-enteric motility.

Uffreduzzi affirmed that gastro-entero anastomosis, although at present blamed by many for unsuccessful end results, has elicited a high degree of success and, in better than 50 per cent of the cases, complete and definite cure. Pyloric exclusion, however, is contraindicated. Jejunostomy is indicated in exceptional cases, but the results of limited resections are not always favorable. In virtually all the cases of Uffreduzzi's service in which pylorotomy had been performed according to Joad's method, the author was constrained to perform a second intervention. Nor have favorable results been yielded by resection of the intercostal nerves and section of the gastric branches of the vagus. The problem of palliative resection has assumed a predominant importance in recent years. According to Finsterer the end results in 90 per cent of the cases should be completely favorable. Uffreduzzi dealt with the technique of extensive resections, pointing out how the excision of large segments of the gastric wall has tended effectively to prevent recidivation, especially in predisposed patients, as the procedure counteracts gastric acidity. Conversely, the diminished stomach can be the cause of many disturbances such as anacidity, postoperative anemia and postoperative peptic ulcer. The period required for the patient's organism to adapt itself to the new condition may be protracted. The patient should be observed and the dietary based on a rational reeducation of the stomach. The diet should at first be quantitatively small and not much varied. Anachlorhydria is the chief condition that will require attention. Compensatory, functional adjustments and vicarious activities will be quick to counteract the deficiencies in hydrochloric acid and pepsin. Recidivation

of resectioned ulcer is an extremely rare incident, it occurs in perhaps 1 per cent of the cases. According to the author this complication is in part imputable to the peptic property of the gastric juice and in part to deficient antipeptic property of the gastric mucosa.

Dr Mairano described the behavior of the digestive secretions following various interventions for gastric ulcer. On the basis of the data reported by other investigators and of his own follow-up observations of the digestive processes of numerous patients, the author concludes that constant modification of the acidity is not an inevitable sequel of gastro-entero anastomosis. More often there is a decrease in hydrochloric acid or in total acidity. There are rare cases of anachlorhydria, but this condition is almost never dissociated from total acidity. In some patients a persistence of hyperchlorhydria is observed following the intervention and in some cases there is even an exacerbation of this condition, probably the result of incomplete resection or of persistence of the heterotopic zones of the antral mucosa, especially in the duodenum.

Dr Stoppani described the advances achieved by roentgenologic studies of the gastric mucosa, the entire stomach and the upper part of the jejunum. From a roentgenologic standpoint, the problem following excisions in the lesser curvature is to determine whether the stomach can maintain its functional capacity or whether it presents alterations that render further roentgenologic studies unnecessary.

Dr Foa for the last ten years has had experience in the management of patients with duodenal ulcer at the Turin Surgical Clinic before and after operation. As most satisfactory technical methods of visualization, he mentioned studies obtained after the patient has ingested a light meal, visualization of the mucous plicae of the gastroduodenal-jejunal regions, and serialographs obtained with dosed compression.

#### LATE RESULTS OF THE SURGICAL TREATMENT OF URINARY LITHIASIS

Prof Domenico Taddei of the Florence Surgical Clinic reported his observations on the sequels of nephrectomy, conservative kidney operations, cystostomy and lithotresis. According to Taddei, nephrectomy is indicated in the presence of such signs as ectasia, suppuration or sclerosis and if the other kidney is healthy. The remaining kidney usually functions well and the defect gives rise to no incidents in case of pregnancy, further surgical operation or intercurrent illnesses. Nephrectomy is still performed in about one third of the cases. Postoperative persistence of pyuria, fistulas or refluxes are rarely observed. Subsequent calculosis of the remaining kidney is an unusual incident, occurring in about 5 per cent of the cases.

Renal and pyelic calculoses in which conservative treatment is indicated are usually of the aseptic type or of the type characterized by mild infection, a single or a few localized concretions with little alteration of the kidney and little or no ectasia of the excretory passages. The criteria of operability differ among surgeons. Whereas in a limited number of cases a virtually complete recovery can take place, in a majority of cases, the postoperative course is marked by a persistence of infections, ectasia and functional incapacity. Recidivation especially in calculosis of the calyx, is frequent. Roentgenography as a visual aid during actual operation represents a great advance. Since 1928 Taddei has advocated a technical procedure of his own device, which is at the disposal of any surgeon. Postoperative treatment of patients directed at conservation of renal functional capacity, is based on the as yet relatively unsolved etiologic problem of calculosis. Today this question is more complex than ever since both infection and diathesis are considered to be factors. Among other factors suggested by present-day investigators are the urinary pH, colloidal condition of urinary salts, endocrine disorders and avitaminosis.

Indications for pyelotomy are simple absence of parenchymal lesions, single calculus of the pelvis, and slight retention. Also for nephrotomy there are particular indications. The width of renal incision is apparently of little importance in postoperative functional incapacity since the latter condition depends rather on other factors such as infections, ectasia and sclerosis. In many cases it is preferable to abstain in other conservative operations are indicated. In cases presenting pyonephrosis, nephrectomy may be imperative.

#### PATHOLOGY AND THERAPY OF THE NEUROHYPOPHYSIAL SYNDROME

The third subject was discussed in joint session with the Society of Internal Medicine. Professor Di Guglielmo, representing the internists, differentiated two categories of neurohypophysial syndromes, the endosellar and the juxtasellar. The first group comprises the syndromes of hyperpituitarism both acidophil and basophil. To the second group belong the syndromes of hypopituitarism and of apituitarism (Simmonds' disease). The author took up the diagnostic criteria of the various forms. The most important medical therapeutic procedure is incretotherapy, pluriglandular parenteral application is most effective, especially if combined with treatment of other coexistent factors such as syphilis or tuberculosis. The curative results of this procedure are of an ephemeral nature, however, since after a certain time an antihormone effect is manifested. In treatment of the syndromes of apituitarism, sometimes spectacular results can be elicited by prolonged administration of various glandular extracts from the anterior lobe of the hypophysis, the thyroid, the gonads and the adrenal cortex.

Professor Chiasserini spoke of sellar and parasellar aneurysms and of the usual treatment of these, which consists of ligation of the internal carotid at the neck. The most common hypophysial tumors are adenomas of the anterior lobe, these are differentiated cytologically as chromophobic (retanulocytic) and chromophilic (granulocytic), the latter may be subdivided into eosinophilic and basophilic. Eosinophilic adenomas form the anatomic basis of acromegaly and of acromegalic gigantism. Basophilic adenomas can produce the chiasmatic syndrome described by Cushing, which is characterized by bitemporal hemianopia, primary optic atrophy and roentgenologically demonstrable modifications of the sella turcica. The x-ray visualizations are of fundamental diagnostic importance, since they demonstrate virtually any enlargement of the sella, the so called sellar expansion.

Chiasserini outlined both the palliative and the radical surgical treatment of hypophysial tumors. The most suitable palliative interventions are subtemporal decompression and hypophysial puncture. At present the operative approach of predilection is by way of the frontal bone and the sphenoid.

## Marriages

- JAMES H. HOLLIMON, Houston, Texas, to Miss Lora Sherman of Picayune, Miss., Oct. 6, 1937.  
SPENCER T. TRICE, Talco, Texas, to Miss Hazel Dell Graham of Texarkana, Nov. 13, 1937.  
HAROLD F. LANSHE to Miss Pauline McHassell, both of Harrisburg, Pa., January 5.  
CLARK R. ROMINGER, Cresco, Iowa, to Miss Alice Jensen of Valley, Neb., Dec. 30, 1937.  
GEORGE H. STEELE, Belmond, Iowa, to Miss Inga Hill of Aurora, Minn., January 4.  
ROLAND D. PORTER, Abington, Pa., to Miss Gertrude S. Reed of Pottstown, recently.  
JOHN M. PRESTON to Mrs. Lula W. Ellis, both of Lancaster, S. C., Dec. 4, 1937.

## Deaths

**William Edgar Darnall** ♂ Atlantic City, N J , University of Virginia Department of Medicine, Charlottesville, 1895, Secretary of the Section on Diseases of Children of the American Medical Association, 1900-1901, and fourth Vice President in 1914, member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Clinical and Climatological Association, fellow of the American College of Surgeons, member of the state board of medical examiners, gynecologist to the Atlantic City Hospital and consulting gynecologist to the Municipal Hospital, aged 68, died, Dec 27, 1937, of coronary occlusion

**Levy Millsbaugh Hathaway** ♂ Colonel, U S Army, retired, Owensboro, Ky , University of Virginia Department of Medicine, Charlottesville, 1901, entered the army as an assistant surgeon in 1902 promoted through the various grades to that of colonel in 1928, retired in 1933 for disability in line of duty, was awarded the Distinguished Service Medal for meritorious service during the World War fellow of the American College of Surgeons, aged 60, died, Dec 14, 1937

**Truman James Allen** ♂ Brandon, Vt , University of Vermont College of Medicine, Burlington, 1912 associate professor of neurology at his alma mater, member of the American Psychiatric Association and the New England Society of Psychiatry, medical superintendent of the Brandon State School on the staffs of the Mary Fletcher Hospital Burlington, and the Rutland Hospital, aged 49, died, Dec 29, 1937

**Clarence Martin** ♂ St Louis, Barnes Medical College St Louis, 1898 member of the American Urological Association, on the staffs of the Missouri Baptist, Josephine Heitkamp Memorial, St Louis County and St Louis City hospitals, served during the World War, editor-in-chief of the *Urologic and Cutaneous Review*, aged 60, died, Dec 7, 1937, in the Jewish Hospital, following a gallbladder operation

**Esther L Blair**, Pittsburgh, Woman's Medical College of Pennsylvania, Philadelphia, 1890, physician to women, Carnegie Institute of Technology, member of the Medical Society of the State of Pennsylvania, physician to the American Red Cross during the World War, aged 75, died, Dec 11, 1937, in the Orange (N J) Memorial Hospital, of myelogenous leukemia and arteriosclerosis

**Robert Valentine Boyce**, Hartford, Conn , University of Vermont College of Medicine, Burlington 1913, member of the Connecticut State Medical Society and the New England Obstetrical and Gynecological Society, served during the World War, past president of the city board of health, aged 47, on the staff of St Francis Hospital, where he died, Dec 29, 1937, of pneumonia

**Ralph J Levy** ♂ New York, New York Homeopathic Medical College and Flower Hospital, New York, 1914, formerly assistant professor of gynecology and obstetrics at his alma mater, fellow of the American College of Surgeons, attending obstetrician and gynecologist to the Broad Street and Park East hospitals, aged 49, was found dead, Dec 12, 1937

**Frederick McKendrie Lowe**, Kansas City Mo , Rush Medical College, Chicago, 1903, member of the Missouri State Medical Association, formerly associate professor of physiology at the University Medical College of Kansas City, for many years on the staff of the General Hospital aged 66, died, Dec 20 1937 of peritonitis and carcinoma of the cecum

**Burton Sylvander Booth**, Troy, N Y Albany (N Y) Medical College 1889, member of the Medical Society of the State of New York fellow of the American College of Surgeons, veteran of the Spanish-American and World wars consulting laryngologist to the Leonard Hospital, aged 69, died, Dec 2 1937 of heart disease

**Isadore Goldstein** ♂ New York, Cornell University Medical College New York, 1904, member of the American Academy of Ophthalmology and Oto-Laryngology, on the staffs of the New York Eye and Ear Infirmary, Sydenham Hospital and the Mount Sinai Hospital, aged 59, died, Dec 23 1937

**Samuel Ginsburg**, Norwich, Conn , Jefferson Medical College of Philadelphia, 1908 member of the Connecticut State Medical Society American Psychiatric Association and the New England Society of Psychiatry, on the staff of the Norwich State Hospital, aged 53, died, in December at New York.

**Willard C Kendig**, Cincinnati, Medical College of Ohio Cincinnati 1891, formerly assistant physician to the Longview Hospital, for many years examining physician to the Probate

Court, aged 68, died, Dec 25, 1937, in the Jewish Hospital, of cerebral arteriosclerosis and chronic nephritis

**Rafael Lopez Sicardo**, San Juan, P R , College of Physicians and Surgeons, Baltimore, 1907, chairman of the Puerto Rico Insular Board of Health, member of the Medical Association of Puerto Rico, medical superintendent of the Capital City Hospitals, aged 62, died, Dec 22, 1937

**Gilbert Newton Lehr**, Rome, N Y , University of the City of New York Medical Department, 1880, member of the Medical Society of the State of New York, formerly county coroner, on the staff of the Rome Hospital, aged 80, died, Dec 23, 1937, of heart disease and nephritis

**William Gordon Bodie** ♂ Wagener, S C , Medical College of the State of South Carolina, Charleston, 1916, served during the World War formerly county health officer, aged 45, died, Dec 31, 1937, in the Baptist Hospital, Columbia, of injuries received when struck by an automobile

**Samuel Albert Lundy**, Fort Worth, Texas, Fort Worth School of Medicine, Medical Department of Texas Christian University, 1911, member of the State Medical Association of Texas, served during the World War, aged 58, died suddenly, Dec 11, 1937, of coronary occlusion

**Charles P Dolan**, Worthington, Minn State University of Iowa College of Medicine, Iowa City, 1880, member of the Minnesota State Medical Association, for many years county coroner, and health officer of Worthington, aged 80, died, Dec 23, 1937, of hypostatic pneumonia

**Alexander Crane Eastman**, Sarasota, Fla , Harvard University Medical School, Boston, 1900, served during the World War, formerly on the staffs of the Mercy and Springfield hospitals, Springfield, Mass , aged 62, died, Dec 23, 1937, of chronic staphylococci septicemia

**Donnie Arnold Burress**, High Point, N C , Louisville (Ky) and Hospital Medical College, 1908, formerly on the staff of the Burrus Memorial Hospital, aged 57, died, Dec 2, 1937, in Guilford County Sanatorium, Jamestown, of actinomycosis of the lungs

**Wilson C Martin**, Mocksville, N C , College of Physicians and Surgeons, Baltimore, 1888, past president and secretary of the Davie County Medical Society, member of the county board of health aged 72, died, Dec 5, 1937, of carcinoma of the sigmoid

**William Lucien Heizer Sr**, Lexington, Ky , Hospital College of Medicine, Louisville, Ky , 1905, member of the Kentucky State Medical Association, formerly state registrar of vital statistics, aged 57, died, Dec 9, 1937, of coronary occlusion and nephritis

**John W Bowers**, South Portland, Maine College of Physicians and Surgeons, Baltimore, 1882, member of the Maine Medical Association, aged 76, died, Dec 7, 1937, in the Maine General Hospital, Portland, of heart disease, stricture of the ureter and uremia

**Charles Emmanuel Kaufman**, West Haven, Conn , Yale University School of Medicine, New Haven, 1920, member of the Connecticut State Medical Society health officer of West Haven aged 51, died, Dec 3, 1937, of coronary occlusion and arteriosclerosis

**Robert Edgar Hughson**, Yorkville, Ohio, Ohio State University College of Medicine, Columbus, 1931, member of the Ohio State Medical Association, aged 34, on the staff of the Martins Feiry (Ohio) Hospital, where he died, Dec 21, 1937, of uremia

**George Riley Keen**, Scottsville Ky , University of Tennessee Medical Department Nashville Tenn 1900 member of the Kentucky State Medical Association, aged 64, died, Dec 5 1937, in the Protestant Hospital, Nashville, of carcinoma of the liver

**Samuel John House**, Brentwood Tenn Rush Medical College, Chicago, 1921 formerly assistant professor of clinical medicine at the Vanderbilt University School of Medicine, Nashville, served during the World War, aged 45, died, Dec 26 1937

**Marion L Albro Gleason**, Providence, R I Tufts College Medical School, Boston, 1907 director of child welfare, department of public health aged 65 died Dec 3, 1937 in the Homeopathic Hospital, of coronary occlusion and diabetes mellitus

**William Franklin Burres**, Urbana Ill Rush Medical College, Chicago 1882 member of the Illinois State Medical Society, formerly member of the state legislature and mayor of Urbana aged 80, died Dec 19, 1937, of arteriosclerotic heart disease

**Fred Carl Schreiber**, San Francisco, University of Kansas School of Medicine, Kansas City, 1926, member of the Associated Anesthetists of the United States and Canada, aged 44, died, Nov 12, 1937, of rheumatic endocarditis and pulmonary edema

**Samuel Milton Black**, Georgetown, Ill., University of Nashville (Tenn.) Medical Department, 1899, formerly health officer, mayor, member of the board of education and bank president, aged 69, died, Dec 20, 1937, of tuberculosis of the lungs

**Charles James Hamilton**, Cornwall, Ont., Canada, University of Toronto Faculty of Medicine, Toronto, 1879, Victoria University Medical Department, Coburg, 1880, for many years medical officer of health and coroner, aged 82, died, Dec 19, 1937

**Darell Martin Busby**, Phoenix, Miss., Mississippi Medical College, Meridian 1909, Memphis (Tenn.) Hospital Medical College, 1913, member of the Mississippi State Medical Association, aged 53, died, Dec 27, 1937, of cerebral hemorrhage

**Joel Augustus Dawson Jr.**, New Orleans, Tulane University of Louisiana School of Medicine, New Orleans, 1937, intern at the Touro Infirmary, aged 28, died, Dec 20, 1937, in Mobile, Ala., of teratoma of the right testicle with metastases

**Antonio G. Maltese**, Chicago, Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1903, member of the Illinois State Medical Society, served during the World War, aged 58, died suddenly, Dec 17, 1937, of angina pectoris

**Lucien Hayden Guptill**, Boston Medical School of Maine, Portland, 1877, University of the City of New York Medical Department, 1878, aged 83, died, Nov 15, 1937, of arteriosclerosis, cerebral hemorrhage and hypostatic pneumonia

**Edward Turner Bramlitt**, Malvern, Ark., Louisville (Ky.) Medical College, 1876, member of the Arkansas Medical Society, past president of the Hot Spring County Medical Society, aged 83, died, Dec 18, 1937, of injuries received in a fall

**George B. Durand**, Waupun, Wis., Homeopathic Hospital College, Cleveland 1874, formerly city health officer, aged 84, died, Dec 23, 1937, in the Wisconsin General Hospital, Madison, of bronchopneumonia, uremia and diabetes mellitus

**John Lewis Lane**, Tuckerton, N. J., Jefferson Medical College of Philadelphia, 1888, mayor of Tuckerton at various times county coroner and member of the board of education, aged 71, died, Dec 2, 1937, of cerebral hemorrhage

**Omer E. Dale**, Everton, Ind., Barnes Medical College St. Louis, 1900, member of the Indiana State Medical Association, veteran of the Spanish-American War, aged 61, died, Dec 24, 1937, of injuries received in an automobile accident

**Herbert Roney Drewry**, Norfolk, Va., Medical College of Virginia, Richmond, 1895, member of the Medical Society of Virginia, served during the World War, aged 70, died, Dec 1, 1937, of hypertensive cardiovascular disease

**Norfleet Mann Gibbs**, New Bern, N. C., University of Maryland School of Medicine, Baltimore 1896, member of the Medical Society of the State of North Carolina, aged 65, died, Dec 25, 1937, of arteriosclerosis and hypertension

**Pellegrino Dacunto**, Newark, N. J., Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1898, member of the Medical Society of New Jersey, aged 70, died, Dec 28, 1937, of coronary sclerosis and cerebral embolism

**Benjamin T. Black**, Campbellsville, Ky., University of Louisville Medical Department, 1885, member of the Kentucky State Medical Association, for many years county coroner, aged 73, died, Dec 30, 1937, of pneumonia

**Forrest Lee Lewis**, Camilla, Ga., Atlanta Medical College 1892, mayor, aged 69, died, Dec 12, 1937, in the Crawford W. Long Memorial Hospital, Atlanta, of coronary thrombosis following resection of the prostate

**Glenford Albert Mowat**, Campbellton, N. B. Canada, McGill University Faculty of Medicine Montreal, Que. 1929, served during the World War, aged 39, died, Nov 5, 1937, in the Soldiers' Memorial Hospital

**J. Stow Ballard**, Berkeley, Calif., Hahnemann Medical College and Hospital of Philadelphia, 1889, aged 75, died, Dec 8, 1937, of carcinoma of the prostate with metastasis to bones and hypostatic pneumonia

**James Craig Mazique**, Natchez, Miss., Howard University College of Medicine, Washington, D. C., 1897, aged 67, died, Dec 12, 1937, in the Natchez Sanatorium, of diabetes mellitus, gangrene and arteriosclerosis

**John Hoch**, West Long Branch, N. J., College of Physicians and Surgeons, Medical Department of Columbia College,

New York, 1892, aged 68, died, Dec 21, 1937, of cerebral hemorrhage and arteriosclerosis

**Robert Roy Hoskins**, Mathews, Va., Medical College of Virginia, Richmond, 1903, member of the Medical Society of Virginia, served during the World War, aged 60, died, Dec 20, 1937, of cerebral hemorrhage

**Robert Bennett Cuthbert**, Trenton, Ga., Hahnemann Medical College and Hospital of Philadelphia, 1895, aged 71, died, Dec 17, 1937, in a hospital at Chattanooga, Tenn., of ruptured peptic ulcer and peritonitis

**Henry H. Lucas** & Paterson, N. J., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895, on the staff of St. Joseph's Hospital, aged 73, died, Dec. 9, 1937, of multiple abscess of the liver

**Anthony Abraham Deep** & Washington D. C., George Washington University School of Medicine, Washington 1924, aged 39, was found dead, Dec 12, 1937, of illuminating gas poisoning, self administered

**John W. Vick**, Marion, Ill., Vanderbilt University School of Medicine, Nashville, Tenn., 1894, member of the Illinois State Medical Society, aged 88, died, Nov 26, 1937, of myocarditis and arteriosclerosis

**Albert Newton Doyle**, Minor Hill, Tenn., University of Tennessee Medical Department, Nashville, 1888, member of the Tennessee State Medical Association, aged 71, died, Dec. 13, 1937, of pneumonia

**Mendel Volkenheim** & New Britain, Conn., Yale University School of Medicine, New Haven, 1908, on the staff of the New Britain General Hospital, aged 52, died, Nov 6, 1937, of coronary occlusion

**Margarito Montemayor**, San Antonio, Texas, Universidad Nacional Facultad de Medicina, Mexico, D. F., 1905, aged 61, died, Nov 9, 1937, in the Physicians and Surgeons Hospital, of coronary sclerosis

**Frederick Michael Boyle**, Buffalo, Niagara University Medical Department, Buffalo, 1893, served during the World War, aged 70, died, Dec 2, 1937, of aneurysm of the aorta and arteriosclerosis

**Edgar Burr Babcock**, Kalkaska, Mich., Michigan College of Medicine, Detroit, 1884, for many years member of the local school board, formerly postmaster, aged 80, died, Dec. 6, 1937, of arteriosclerosis

**Joseph William Long** & Walkersville, Md., Hahnemann Medical College and Hospital of Philadelphia, 1903, served during the World War, aged 58, died, Dec 14, 1937, of coronary thrombosis

**Thomas Alexander Cox**, Hertford, N. C., University of Maryland School of Medicine, Baltimore, 1892, formerly county coroner, aged 69, died, Dec 13, 1937, in Jackson, Miss., of pneumonia

**Elmer Oscar Steeves**, Rugby, N. D., McGill University Faculty of Medicine, Montreal, Que., Canada, 1903, aged 60, died, Nov 19, 1937, of coronary thrombosis and hypertensive heart disease

**A. W. Thompson**, Kansas City, Mo., Barnes Medical College, St. Louis 1904, formerly superintendent of the Kansas City General Hospital, aged 65, died, Nov 17, 1937, of cerebral hemorrhage

**Arie U. Klock**, Ames, N. Y., Albany Medical College 1886, member of the Medical Society of the State of New York, aged 75, died, Dec 10, 1937, of heart disease and cerebral hemorrhage

**Lyman E. Baker**, Mechanicsburg, Ohio, Cleveland Medical College, 1895, aged 67, died, Dec 22, 1937, in the Grant Hospital, Columbus, of hypertensive heart disease and chronic nephritis

**Henry William Straus** & Brooklyn College of Physicians and Surgeons, Baltimore 1913, on the visiting staff of the Jewish Hospital, aged 46, died, Nov 21, 1937, of chronic nephritis

**Harry Andrews Rosenthal**, Clarksburg, W. Va., College of Physicians and Surgeons, Baltimore, 1902, member of the West Virginia State Medical Association, aged 61, died, Nov 12, 1937

**William Rufus Apple**, Paris, Ill., Northwestern University Medical School, Chicago, 1911, aged 59, died, Dec 11, 1937, in St. Anthony's Hospital, Terre Haute, Ind., of heart disease

**Carl Bonning**, Detroit, Université de Strasbourg Faculté de Médecine, Germany 1882, member of the Michigan State Medical Society, aged 82, died, Dec 23, 1937, of coronary thrombosis



**John Taylor Steele** • Dunsmuir, Calif., Manitoba Medical College, Winnipeg, 1924, on the staff of the Dunsmuir Hospital and Sanatorium, aged 38, was accidentally drowned, Nov 28, 1937

**Herbert Augustus Abbott**, San Francisco, University of Nebraska College of Medicine, Omaha, 1896, aged 68, died, Dec 3, 1937, of myocarditis, arteriosclerosis and hypertension

**David E Winer**, Vanderbilt, Mich., Saginaw (Mich.) Valley Medical College, 1903, aged 64, died, Nov 28, 1937, in the Grayling (Mich.) Mercy Hospital, of mesenteric thrombosis

**Caroline Nielsen Conner**, St Ignace Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1876, aged 90, died, Dec 21, 1937, of cerebral hemorrhage

**James Switzer Freeborn**, Magnetawan, Ont., Canada, Victoria University Medical Department, Coburg, 1885, L K Q C P, Ireland, 1887, aged 79, died, Nov 8, 1937

**William A Burnham**, Boulder, Colo., Rush Medical College, Chicago, 1877, aged 89, died, Dec 28, 1937, in the Community Hospital, of arteriosclerosis and bronchopneumonia

**Albert Sidney Johnston Smith**, San Jose, Calif., Washington University School of Medicine, St Louis, 1893, aged 68, died, Nov 13, 1937, of carcinoma of the stomach

**Edmund Willoughby Wilson**, Rolfe, Iowa, State University of Iowa College of Medicine, Iowa City, 1896, aged 69, died Nov 24, 1937, in San Diego, of heart disease

**John M Slaymaker**, Philadelphia Jefferson Medical College of Philadelphia, 1883, aged 76, died, Nov 30, 1937, in the Joseph Price Memorial Hospital, of pneumonia

**Hugh Alexander Elliot**, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1916, aged 45, died, Nov 16, 1937, of progressive muscular atrophy

**John C Shepherd**, Rulo, Neb., University of Louisville (Ky.) Medical Department, 1876, aged 83, died, Nov 7, 1937, of arteriosclerosis and chronic myocarditis

**John Stenhouse**, Toronto, Ont., Canada, University of Toronto Faculty of Medicine, 1894, aged 76, died, Nov 26, 1937, in the Victoria Memorial Hospital

**W Frank Snider**, Liberty, Ill., Hospital College of Medicine, Louisville, Ky., 1889, aged 73, died, Nov 5, 1937, in Clayton, of chronic nephritis and uremia

**Robert Crees**, Napa Calif., University of California Medical Department San Francisco, 1894, aged 78, died, Dec 6, 1937, of a self-inflicted bullet wound

**Wendell Warden Carrothers**, Galt, Ont., Canada, Western University Faculty of Medicine, London, 1920, aged 45, died, Nov 27, 1937, of pneumonia

**Allen Moorman**, Redfield, Iowa, State University of Iowa College of Medicine, Iowa City, 1896, aged 66, died, Nov 3, 1937, of Hodgkin's disease

**R L Stewart**, Koran, La., College of Physicians and Surgeons, Dallas, Texas, 1908, aged 59, died, Nov 23, 1937, of carcinoma of the rectum

**Charles Olivier Milot**, Montreal Que., Canada, University of Montreal Faculty of Medicine, Montreal, 1922, aged 45, died, in November 1937

**Henry Hicks Coleman**, Moncton, N B., Canada University of the City of New York Medical Department, 1877, aged 84, died, Nov 22, 1937

**Jerome F Honsberger**, Kitchener, Ont., Canada Trinity Medical College Toronto, 1886, L R C P, London, 1886, aged 78, died, Nov 9, 1937

**Richard Mason Lipsey**, St Thomas, Ont., Canada, University of Toronto Faculty of Medicine, 1894, aged 73, died, Nov 25 1937

**Louis Joseph Desy**, Montreal, Que., Canada, Laval University Medical Faculty, Montreal, 1889, died, Dec 7, 1937, in Paris

**Moses L Ship**, Montreal Que., Canada, McGill University Faculty of Medicine, Montreal, 1902, aged 59, died, Nov 3, 1937

**Moses Bulian** • Boston Dragomanov Institute Kiev, Russia, 1912, aged 51, died, Nov 17, 1937, of coronary thrombosis

**John F Long**, Luray, Va., Medical College of Virginia Richmond 1873, aged 88, died, Dec 8 1937 of heart disease

**L H Smith** Atlanta Ga. (licensed in Georgia in 1899), aged 68, died Nov 30, 1937, of uremia and mitral stenosis

**Thomas Henry Mott**, Victoria B C Canada Trinity Medical College, Toronto Ont., 1884, died, Nov 13 1937

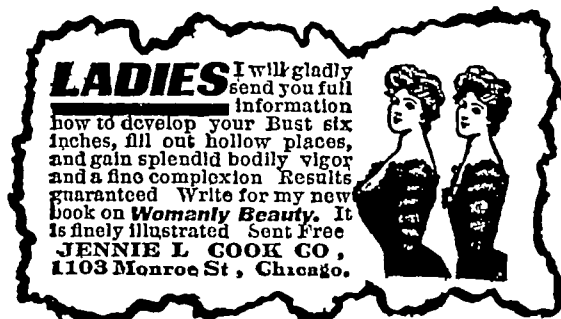
## Bureau of Investigation

CURTIS A DAVIS

### Another Bust-Developer Fraud Is Barred from the Mails

"Youth-Aid Products," a swindling mail-order concern run by Charles A Davis of Los Angeles, was the object of a fraud order issued by the Post Office Department in July 1937. This trade name was adopted by Davis some time subsequent to January 1936, when a fraud order was issued against a Davis scheme known as the "Jennie L Cook Company." It was to evade the 1936 order that Davis assumed the name of "Youth-Aid Products." The business was the same under both names—selling an alleged bust-developer.

Davis is an old offender. More than twenty years ago he was carrying on mail-order frauds in Chicago under various trade names. Because of the flagrant misrepresentation made by Davis at that time for the articles he offered for sale, a fraud order was issued on Aug 7, 1916, against his various trade names. Davis evaded the order by changing most of the names under which he had been doing business, so, five months later—Jan 25, 1917—the post office authorities issued a supplemental order against the new names. Even that did not stop Davis, for he adopted still other names. He continued his business until the postal authorities issued a further supplemental fraud order on Feb 8, 1917, on the later names.



Sometime in the interim between 1917 and 1937 Davis transferred his activities from Chicago to Los Angeles. He is now more than 67 years old but still evidently believes that mail-order frauds are profitable and that the risk of criminal prosecution is negligible. In Los Angeles he used for some years the trade name "Jennie L Cook Company." He claims, so the post office officials report, that Jennie L Cook is the name of a sister who resided next door to the rooming house from which Davis conducted his fraudulent business. Davis is said to have stated that his sister had no financial interest in the fraud.

Just when Davis started the Los Angeles Cook concern fraud does not appear. It is of record, however, that in 1932 the Federal Trade Commission issued a Cease and Desist Order against Curtis A Davis trading as the Jennie L Cook Company of Los Angeles. In this Curtis was ordered to (1) cease advertising as a woman, (2) cease implying in his advertising that the statements he made were from one woman to another, (3) cease claiming that the Jennie L Cook Company was composed of Parisian beauty culturists, (4) cease advertising that the Cook "treatment" was scientific, was made from a French formula, was a constitutional vitalizer and a tissue builder, (5) cease claiming that by the use of the treatment a perfect figure could be developed and the human body could be properly proportioned and (6) cease claiming that the treatment would fill up hollows in the body, give the user strength and remove wrinkles. The facts were briefly noted in this department of THE JOURNAL April 30, 1932.

So much for 1932. But Davis evidently considered that the commission's order was meant in a pickwickian sense for in 1936 he was still at the same old stand operating under the same name and with practically the same claims when the post office officials served notice on him.



According to the memorandum of the Solicitor of the Post Office Department to the Postmaster General recommending the issuance of a fraud order, each bust-developer treatment sold by Davis cost him thirty-five cents and was sold for three dollars. Davis, according to the memorandum, did not advertise in magazines or newspapers, but he obtained his victims by purchasing "sucker lists" from the Chart Letter Company, Chicago, and the Rose Miller Company, Birmingham, Ala.

In December 1935 the post office officials personally served Curtis A. Davis with a citation calling on him to show cause by Jan 3, 1936, why a fraud order should not be issued against the Jennie L. Cook Company. Curtis appears to have ignored utterly the government's action, for the authorities reported that they received no answer to the citation nor did Curtis appear either in person or by attorney, at the hearing. The Solicitor for the Department—Judge Karl A. Crowley—thereupon reviewed the evidence collected by the postal inspectors and concluded that the Jennie L. Cook Company was a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises. Solicitor Crowley recommended the issuance of a fraud order closing the mails to the company. It was issued Jan 11, 1936.

But this apparently did not worry Curtis. He evaded the order by the simple device of adopting a new name—"Youth-Aid Products." A year and a half later (July 9, 1937) the post office authorities issued a supplemental fraud order covering "Youth-Aid Products." Just what mail-order racket Curtis A. Davis will next indulge in is known, probably, only to Curtis.

This brief statement of facts is of importance more because of its social and economic implications than because of the sordid details with which it deals. It is one more example of the inadequacy of our laws in protecting the public against medical fraud.

## Correspondence

### THE ROLE OF INSULIN IN THE PSYCHOSES

*To the Editor*—Dr. H. M. Smith (*THE JOURNAL*, June 5, 1937, p. 1959), commenting on insulin therapy for schizophrenia, says "the coma results from the reaction to insulin rather than from the hypoglycemia." Sakel's own curves (*Neue Behandlungsmethode der Schizophrenie*) indicate blood sugar values which are moderately high (usually in the neighborhood of 60 mg. per hundred cubic centimeters) even though large enough doses to bring on coma were administered. Certainly the possibility is not excluded that an extrahypoglycemic factor may be producing the favorable results of this therapy. If the hypoglycemia were not an essential feature of the treatment, both the hazards and the great expense of insulin therapy might be largely overcome.

The primary functions of insulin in the normal person have not been entirely established. It stores glycogen in the liver and in the muscles. There is some question as to an increased oxidation in the peripheral tissues. However this may be, the hypoglycemia is truly secondary. If the responsible therapeutic factor in the Sakel treatment is the insulin itself and not the secondary hypoglycemia, it might be possible to secure the same effects by giving frequent nourishment or ample dextrose simultaneously with the islet hormone. This problem is being investigated at the present time.

Although it has been stated that the best results are obtained in schizophrenia when shock is prolonged (from three to five hours), no controls have been tested. Before the advent of shock therapy, favorable psychiatric effects were occasionally reported from small doses of insulin. May not the larger doses utilized be directly responsible for the better results?

EUGENE ZISKIND, M.D.  
ESTHER SOMERFELD, M.D.

DOUGLAS DRURY, M.D.  
PAUL GREELEY, M.D.  
Los Angeles

### DOSAGE OF DIGITALIS

*To the Editor*—In the article by Stroud and Vander Vee on digitalis (*THE JOURNAL*, Nov. 27, 1937, page 1809, second column, first paragraph) it is stated that the dry digitalis preparations are to be preferred to the tincture for the reason, among others, that the dose is much more accurate "since even with the standard minim dropper the patient is apt to miscount the number of drops." The inference could be easily drawn from this that correct counting with the standard minim dropper would give correct dosage. Presumably the dropper referred to was the one made official in this country on June 1, 1936, which delivers 80 drops of water in 4 cc but requires from 160 to 180 drops of tincture of digitalis to produce a bulk measure of 4 cc.

A footnote states that "a dose in drops from an ordinary dropper has from two to three times the number of drops as the same amount measured in minims." In this connection it is well to recall that there is at least one dropper furnished with a special tincture of digitalis that practically delivers a minim per drop.

It was freely predicted that the introduction of a standard dropper would add to the confusion about drops and droppers particularly in giving liquid digitalis preparations. It may become necessary to define this dropper as a medicine dropper, official, U. S. P. XI, for water, but with tinctures delivers only one third of a minim per drop.

SINCLAIR LUTON, M.D., St. Louis

### UREA FOR WOUND HEALING

*To the Editor*—The recent discovery of the use of urea in the healing of wounds has been mentioned in *THE JOURNAL*. It might be of interest to younger physicians to know that this discovery was anticipated by farmers a generation ago. In about 1885 I was at the home of a neighbor and he was treating a case of fistulous withers in a horse with his own urine. He told me, "It will heal it right up." I told this to a class a short time ago and one of the members said that in his part of the country farmers husking corn barehanded used this same lotion on their hands to keep them from getting sore and they could husk corn all the fall with no gloves or mittens.

C. J. ELMORE, Liberty, Mo.  
Professor of Biology, William Jewell College.

*COMMENT*—Macalister in 1912 noted the use of comfrey root by the natives of rural England, who applied it to wounds to promote healing. Macalister used a rather strong infusion of the comfrey root in the successful treatment of an extensive rodent ulcer of the chest which under all other methods had continued to grow more extensive. Chemical analysis revealed that the substance contained from 0.8 to 0.9 per cent of allantoin. Subsequently it has been recognized and is described in the British Pharmaceutical Codex under the name *Symphytum*, with the synonym *comfrey root*. It is stated to be the dried rhizome and root of *Symphytum officinale* (*Boraginaceae*). It is stated to contain from 0.6 to 0.8 per cent of allantoin. Allantoin itself is a British Pharmaceutical Codex item and both preparations are described as cell proliferants in Martindale's *Extra Pharmacopoeia*.

About the time allantoin was being prepared for the pharmaceutical market Robinson carried his experimentation one step further and reported that a constituent derived from allantoin was probably responsible for its effectiveness. The product is urea and it is even less expensive than allantoin. Urea when manufactured in enormous quantities, is readily available.

An article appearing in *THE JOURNAL*, April 3, 1937, by Holder and MacKay, notes that Simmers and Kirk more than twenty years ago used urea solutions in the dressing of wounds with excellent results that Millar used it later in suppressing the foul odors of sloughing cancer, and that Folger and Foster used it in treating infected wounds of various sorts.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### RESIDUAL SIGNS OF CORONARY OCCLUSION

*To the Editor*—I was requested to examine an applicant for an insurance policy January 19. The applicant is 46 years old and is the owner of a wholesale grocery establishment where he is busily engaged the entire day. His general appearance, actions and behavior did not indicate any possible ailment. He was alert quick in his actions, stated that he had never been treated for any ailment and also stated that he never received compensation for any physical disability. His weight is 162 pounds (73.5 Kg), height 5 feet 4 inches (163 cm), blood pressure 124 systolic 78 diastolic and pulse rate 74 per minute, the pulse being regular and of good quality. The heart and lungs showed no apparent pathologic changes. The urine examination was negative save for the Feihling test being slightly reduced. I therefore recommended the acceptance of the risk. Shortly afterward I received a letter from the home office stating that the applicant had been rejected for the reason that he was treated for coronary occlusion in February 1937, as corroborated by electrocardiogram; he also received compensation for this disability. Will you kindly inform me whether it is possible to find any physical signs or symptoms of coronary occlusion a year after it has occurred? Are there any such signs left?

M D Connecticut

*ANSWER*—In many cases there are signs and symptoms that will point to a coronary occlusion a year before, whereas in other cases there are none. The occlusion of a large artery with an extensive infarction of the heart muscle that later causes scarring with a thinning and bulging of the wall of the ventricle may lead to results that are clearly in evidence a year later. Increase in the size of the heart, alterations of its rate and rhythm, dyspnea and other evidences of cardiac weakness, and angular distress on exertion, together with significant electrocardiographic changes, may be present. Mild attacks due to occlusion of a small artery may be so nearly recovered from that no symptom or sign of the accident can be detected a year later. Even the electrocardiogram may seem normal or show changes so slight that they can be passed as meaningless. Had the applicant not lied regarding his health history of the past year the examination would perhaps have been more intensively centered on the heart and might have included an electrocardiogram. Possibly in this way some suspicion of residual damage might have been aroused. Yet no such evidence might have been found.

### PELLAGRA

*To the Editor*—A patient with pellagra of moderate severity has a cutaneous disturbance involving the backs of both hands, two fingers of each hand, the legs below the knees and the chest, throat and chin. The condition on the legs, chin and chest has cleared up and on the hands except for a small area. The treatment used was a potassium permanganate solution for the skin and liver extract for the anemia. The red blood count is now 4,200,000, white count 6,300, hemoglobin 7.590. Sedatives are still necessary to induce sleep and relieve the itching of the hands. The patient has a nurse and I am pushing the pellagra diet. What else is there to do for the itching and mental state? What outline do you offer for general treatment?

RUSSELL L. HODGE, M.D., North Kansas City, Mo.

*ANSWER*—The general treatment of pellagra is to keep the patient in bed until convalescence is well established. Constant nursing care will conserve the patient's strength and will assure one that specific and therapeutic materials have been given. It is essential that a pellagrino eat a well balanced diet of 4,500 calories or more each day. Unless there is vomiting or diarrhea, it is desirable that this diet be administered in the form of solid foods. Diets suitable for patients with pellagra were discussed by Spies, Chinn and McLester in *THE JOURNAL*, March 13, 1937, page 853. It is also desirable that the patient receive about 6 ounces (175 cc) of dried powdered brewers yeast daily. It is best tolerated when given in doses of from 20 to 30 Gm in 200 cc of milk. If the patient still has lesions of the mucous membranes, nicotinic acid may be given in five doses of 100 mg each per day. It is perhaps advisable to discontinue sedatives for a short period even though the patient does not sleep well, since the mental symptoms of pellagra often overlap those of drug intoxication and apparently patients with pellagra are more susceptible to some of these drugs than

are normal persons. The itching and burning sensations associated with pellagra usually disappear promptly after definite recovery has set in. If these symptoms linger, another cause for them should be sought. Symptomatically, they are often relieved by a mixture of 1 per cent phenol in menthol, applied locally.

### DOSAGE OF DESICCATED THYROID

*To the Editor*—Can any child take 9 grains (0.6 Gm) of desiccated thyroid daily for more than one year and gain weight and not have hypothyroidism? What are the maximum doses of thyroid known to be given over long periods and at what ages?

M D Elmhurst, I. I.

*ANSWER*—The question of hypothyroidism in a particular case can be settled beyond doubt by observing any change in the clinical condition of the patient and the basal metabolic rate after omitting thyroid for from four to six weeks. Six-tenths Gm of desiccated thyroid daily is an unusually large dose if the thyroid is standardized according to U. S. P. specifications. Marked variations in dosage of thyroid may occur in different persons and rarely in the same person at different times. Most patients with myxedema sustain a normal basal metabolic rate by 0.13 Gm or less of U. S. P. desiccated thyroid daily. Gain in weight while taking 0.6 Gm of U. S. P. thyroid daily would suggest that much of the thyroid taken was not absorbed and, if anything, would argue against the presence of true hypothyroidism, or myxedema. Some patients, more particularly those with pituitary disease, anorexia nervosa or similar conditions, may need larger doses to maintain a metabolic rate at or near the standard average. Thyroid dosage should, in each and every instance, be determined for the individual patient by his or her response to constant dosages. There is no constant variation of the dosage with different ages.

### ALLERGY OF MOUTH TO FOODS

*To the Editor*—A woman aged 18 has had a sore ulcerated roof of the mouth on two occasions in the last two months. She is in excellent physical condition. Her tonsils are out and her teeth and gums are apparently healthy. Her two attacks have been ushered in by a hive-like condition of her face characterized by swelling, itching and a sense of not feeling well. There is no fever. In about two days the face condition clears up (it has always been in the same places) and the mouth condition which has not been severe but only sore becomes aggravated then ulcerated. At no other place in the oral cavity is there pathologic disturbance. Menstruation has no effect on the condition. I have used sodium perborate and other oral antiseptics without any relief. After ten days it goes away. I have blamed some allergic factor for the condition but what would it be?

M D Wisconsin

*ANSWER*—The condition described is most likely an allergic manifestation. It is apparently an urticarial type of reaction on the skin associated with a canker sore type of lesion in the mucous membranes of the mouth. Recurring canker sores caused by allergic factors have been described a number of times and are apparently not rare in allergic practice. Almost always these lesions are caused by an allergy to foods. Among some of the common foods which have been incriminated in this type of allergy have been chocolate, wheat and milk. If possible, this patient should be tested for food allergy. If such means are not available, an elimination diet should be tried. It is also possible that by careful observation and keeping a record of foods preceding the onset of these attacks, the cause may be identified in this manner.

### DISSOLVING TISSUES FROM SKELETON—BLEACHING BONES—ARTICULATION OF SKELETON

*To the Editor*—Will you kindly advise me of a suitable fairly simple technic for dissolving some remaining tissue from an old skeleton and a bleaching agent for the bones? If there are available any instructions for the articulation of a skeleton showing the best method of placing the wires, this also would be appreciated.

R. L. MANSELL, M.D., Medina, Ohio

*ANSWER*—The tissues adherent to an old skeleton can be removed first by careful dissection. The remaining ends of muscles and tendons can be removed by boiling the parts in sodium hydroxide solution (from 4 to 10 per cent strength), the stronger solution should be used only if it is the intention to disarticulate the bones and to remove the cartilages covering the ends. In either case the bones should be carefully watched and removed every ten minutes. The remnants of tissues should then be cut or scraped off and the bones brushed with a stiff brush and then returned to the solution, this process is to be repeated until the bones are as clean as desired. Some of the smaller bones should be taken out earlier than the large ones. The cord and the dura mater may be removed from the vertebral canal without disarticulating the vertebrae by loosening the dura at each end of the vertebral canal. The intervertebral

disks will withstand boiling for some time and may be left in place if so desired and the vertebral column preserved in one piece

When the bones are sufficiently clean, the soda is poured off and the bones are washed in hot water. Any excess of grease is removed by soaking in gasoline, and the bones may then be bleached by immersion in 10 per cent hydrogen peroxide. Chlorinated lime is sometimes used for this purpose, the bones being boiled in it for a quarter of an hour, this bleaching agent, however, is apt to injure the bone, making the outer surfaces scaly and soft. Finally, the bones are dried in the open air.

If desired, they may be varnished over with a varnish made of Canada balsam, dissolved to the desired thickness in a mixture of equal parts of xylene and alcohol.

The wires and metal parts required for the articulation of the skeleton may be obtained from some of the companies which deal in skeletons, including the Denoyer-Geppert Company, 5235 North Ravenswood Avenue, Chicago.

#### BRAIN INJURY OR POST TRAUMATIC NEUROSIS

*To the Editor*—In July 1935 an 18 year old girl, a housemaid was struck by an automobile and thrown 40 or 45 feet. She suffered contusions of the left parietal region, right knee and right arm. There was also a deep laceration about 1 1/2 inches long on the right arm. Three days after the accident she noticed weakness in her left arm and leg. She was told by her attending physician not to worry about the weakness. I first examined her in March 1936 when she complained of weakness in the right arm and leg and a tingling sensation present only for from two to four minutes every five to seven days. The weakness of the hand had been progressive and was then so severe that she could write only half of an ordinary letter page without stopping to rest. Physical examination at this time showed the blood pressure in the right arm 140/100 and in the left arm 120/100. The reflexes were equal and active. Sensation to touch, heat, cold and joint position was normal. Coordination was good except that after slight exercise of the right hand definite weakness accompanied by moderate incoordination would appear. In May 1936 the tingling sensation was less severe. The blood pressure in the right arm was 128/100 and in the left arm 120/100. The weakness continued. In July 1936 the blood pressure in the right arm was 130/86 and in the left arm 120/80. Weakness continued. In August 1937 she complained of weakness in the right forearm and hand and in the right leg and foot. Muscular strength was good above the knee and elbow. There have been no attacks of tingling for six months. Reflexes and the sensorium continue to be normal. Is there any anatomic basis that will explain these symptoms? If not what other tests should be done before making the diagnosis of neurosis? Could these symptoms possibly be the precursors of jacksonian epilepsy? M D Illinois

*ANSWER*—Before making a diagnosis of post-traumatic neurosis it would be wise to make an encephalogram to rule out brain injury. Only if an encephalogram, skull roentgenograms, spinal fluid pressure studies and repeated careful neurologic examinations give normal results could one consider the diagnosis of neurosis. The tingling sensations described might well be a sensory jacksonian discharge.

#### DIPLOPIA AND PTOSIS

*To the Editor*—A Negro aged 27 woke one morning with diplopia. This condition has persisted unchanged for one month. There is no headache, vomiting or dizziness. Examination shows ptosis of the right eyelid and almost complete paralysis of the superior, inferior and internal recti of the right eye. The left eye is normal. The pupils are equal and react to light and in accommodation. The fundi and visual fields are normal. Complete neurologic examination reveals no other abnormalities. Repeated Kahn tests are negative. Spinal tap is normal. An incomplete peripheral lesion of the oculomotor nerve was diagnosed. Could you help me as to other possible locations of the lesion and as to possible underlying etiology? M D New York

*ANSWER*—It is not stated whether or not the right pupil was larger than the left. From the neurologic information given the probabilities are that the lesion is in the region of the nucleus of the third nerve rather than in the nerve branches themselves, and the cause is probably a localized encephalitis.

#### RADIUM AND INCIPIENT CATARACT

*To the Editor*—A patient has been advised that the use of radium on the lids of her eyes would be a cure for incipient cataract. Is there information to be had regarding this? Louis L. Sherman, M.D. Oakland Calif

*ANSWER*—The use of radium as a cure for incipient cataract has been tried off and on during the past twenty-five years but has been entirely abandoned because of the dangers. It is well known that the external application of radium about the orbit can cause the production of lens opacities of the posterior portion of the lens in a characteristic form (Meesmann, *Kurzes Handbuch der Ophthalmologie*, vol 5). There is no valid reason to believe that radium applied to the eyelids can cause a disappearance of lens opacities.

Headed by Dr. Allen Greenwood of Boston, a committee of the American Academy of Ophthalmology and Oto-Laryngology reported at the 1933 meeting (*Tr. Am. Acad. Ophth. & Oto-Laryng.*, 1933, p. 478) on its investigation of the medical treatment of incipient cataract. The gist of the report was "We fail to find that there is scientific proof that the medicinal treatment of lenticular opacities will cause a restoration of the normal transparency of the lens."

#### ETIOLOGY OF ROSACEA

*To the Editor*—What is the etiology of rosacea?

J. S. BEALLE, M.D., Holt, Ala.

*ANSWER*—Rosacea occurs more often in women than in men and usually after 30 years of age, though rarely it appears earlier. The more severe forms usually are found in men. It may be produced by a number of causes acting individually or together. Undoubtedly there is a hereditary predisposition. Alcohol is popularly considered to induce rosacea, but it actually does so in only a minority of cases. Alcohol, very warm foods and highly spiced foods will aggravate a rosacea already present. Gastro-intestinal disturbances may bear a relation. Both hypacidity and hyperacidity have been found in gastric analyses. Constipation is frequently mentioned by women. Cirrhosis of the liver may also be a factor. Many patients have organic or functional disturbances of the ovaries and uterus. Among the locally acting agents, *Demodex folliculorum*, an organism that lives in the hair follicles, and Sabouraud's bacillus of seborrhea have been incriminated. Infections within the nose, such as chronic folliculitis and obstructions, may be causative. Wind and weather probably can induce it and certainly make an existing rosacea worse.

#### PRESERVATION OR STERILIZATION OF CARTILAGE FOR GRAFTING

*To the Editor*—Please let me know what chemicals are suitable for sterilizing cartilage to be used in isoplastic grafting.

JOHN F. FORD, M.D., New York.

*ANSWER*—The question does not make clear whether it is wished to sterilize cartilage that has become contaminated or whether it is the desire to preserve sterile cartilage for later transplantation. In general, cartilage which is to be used as a transplant is removed under rigidly aseptic conditions and if the transplantation is done immediately the use of an antiseptic is neither necessary nor desirable. Occasionally conditions may arise in which it is desirable to preserve an excised cartilage for later transplantation. When the delay is to be of only a few hours, immersion of the sterile cartilage in sterile physiologic solution of sodium chloride is satisfactory. For longer preservation, immersion in an antiseptic solution, such as a 10 per cent solution of tincture of metaphen, has been recommended. There are no data at hand, however, which would enable one to state what chemical is to be preferred.

If the excised cartilage has been contaminated, the use of an antiseptic solution for sterilization should not be depended on under any circumstances.

#### USE OF NARCOTICS IN PARALYSIS AGITANS AND CANCER

*To the Editor*—A few months ago I was called to see a patient with advanced paralysis agitans complaining of severe muscle cramp. The usual remedies for this disease have been used to the extent that they are no longer effective. In order to give him some rest at night his mother begged me to give him a narcotic. The results of the narcotic were gratifying that he has taken it during the daytime also. Is it safe to prescribe morphine for this patient and to what extent can one prescribe and still abide by the narcotic law? How much morphine does the law allow one to prescribe for a patient with cancer? M D Illinois

*ANSWER*—No person is immune to narcotic addiction. Morphine administered to any hundred persons will make a hundred addicts irrespective of the pathologic necessity. One should avoid repeating the dose of an opiate when great relief is given or when more than an anodyne effect is secured, especially in neurotic patients.

In an inoperable carcinoma there is no narcotic question involved, the patient should receive enough morphine or other opiate to control the pain. As a rule it is much better to administer opiates by mouth and avoid the quick hypodermic narcotic relief sensation. Where narcotics in chronic incurable cases are a necessity it is much better to give the total twenty-four hour amount to be used in equal divided doses and administer them two or three times a day at regular intervals. The narcotic law says nothing about the amount one can prescribe or give any patient.

REMOVAL OF CONJUNCTIVAL SILVER STAIN—  
HAIR DYES AND OPTIC ATROPHY

To the Editor—Can anything be done to remove a conjunctival stain due to mild protein silver (argyria)? Is there any basis for the repeated statement that hair dyes may be the cause of glaucoma or atrophy of the optic nerve?

M. SHELDON LORD MD Schenectady N Y

ANSWER—Conjunctival argyria can be removed by the method of Stillians and Lawless, which is applied to the staining of the skin. A mixture of equal parts of 6 per cent sodium thiosulfate and 1 per cent potassium ferricyanide is injected subconjunctivally through a fine needle, which must be made of platinum. The eye may be cocainized in the usual way or procaine hydrochloride may be injected previously. Not more than 0.4 cc is usually injected at a time, this being distributed under the bulbar conjunctiva in the stained area. The procedure can be repeated as often as necessary to cover the exposed portion. It is only necessary to treat the part of the bulbar conjunctiva that is exposed when the eye is opened. The inside of the lids is usually left alone.

There seems to be little basis for the belief that hair dyes are the cause of glaucoma or optic atrophy, although they may cause damage to the lids and cornea. Hair remover containing thallium does cause optic atrophy when taken internally or absorbed through the skin in large quantities.

## DINITROCHLOROBENZENE AND CATARACTS

To the Editor—Is there any evidence attributing opacities of the crystalline lens to general poisoning by exposure to dinitrochlorobenzene?

HOWARD C KNAFF MD East St Louis Ill

ANSWER—The best general studies on dinitrochlorobenzene have been made by the Russians Gorkin and Kagan at the Ukrainian Institute of Pathology and Hygiene of Work. This investigation has been extended a long review in the *Journal of Industrial Hygiene and Toxicology* (18 156, 1936). The results of the investigation closely associate this substance with dinitrophenol as to toxic properties, although the two substances are chemically dissimilar except that each represents a nitro compound of the benzene ring. The recent extensive use of dinitrophenol for the treatment of obesity was followed, beginning in 1934, by frequent occurrence of cataracts. The incidence of cataracts was as high as 1 per cent in some series. Because of similarity in the general states produced by these two chemicals, cataracts from the action of dinitrochlorobenzene is a fair expectancy, although no precise case records have been found.

## EXCESSIVE LIBIDO IN WOMAN

To the Editor—A woman aged 30 is greatly troubled with excessive libido. She had no sex trouble till the birth of her first baby five years ago. During her two subsequent pregnancies she was indifferent sexually but excessive libido returned following each delivery. Would you suggest that antuitrin S or theelin or both are indicated?

M D Michigan

ANSWER—Neither of the preparations mentioned nor similar ones have any effect on libido, as it is not ovarian in origin. Even removal of both ovaries will have no effect. The seat of the trouble is in the brain and not in the sexual apparatus. For the severer types of the condition, called nymphomania, every possible therapeutic method, including castration, roentgen therapy of the ovaries, hypnotism and even marriage to a male suffering from a similar condition (satyriasis), has been tried with absolutely no effect. The milder cases may be treated with bromides or similar sedatives. Opiates must be avoided. It is important to determine whether the condition is induced or exaggerated by the practice of withdrawal on the part of a husband or even impotence partial or complete, of the husband.

## LEUKOPENIC INDEX

To the Editor—I should like to add the result of my study on the subject of the leukopenic index to your answer to the questions from M D Arkansas in THE JOURNAL Dec 11 1937. The blood count after ingestion of 8 ounces of milk following a fifteen hour fast should not be influenced at all if the patient is normal. I feel too that no definite rule can be made concerning the behavior of the leukocytes following ingestion of any food. From the point of view of clinical medicine any food that causes distress should be removed from the patient's diet. This view however cannot be corroborated by a laboratory finding of either leukocytosis or leukopenia. For detailed comment and experience on this subject I would refer the physician not only to the works you have already mentioned but also to my article in the July 3 1937 issue of THE JOURNAL, entitled Leukocyte Behavior During Gastric Analysis.

CHARLES FRANCIS LONG MD Philadelphia

## Medical Examinations and Licensure

## COMING EXAMINATIONS

## STATE AND TERRITORIAL BOARDS

- ALABAMA Montgomery June 28 Sec Dr J N Baker 519 Dexter Ave Montgomery
- ARIZONA Basic Science Tucson March 15 Sec Dr Robert L Nugent Science Hall University of Arizona Tucson Medical Phoenix April 5 6 Sec Dr J H Patterson 826 Security Bldg Phoenix
- ARKANSAS Medical (Regular) Little Rock June 21 22 Sec State Medical Board of the Arkansas Medical Society Dr L J Kosminsky Texarkana Medical (Eclectic) Little Rock June 21 Sec Dr Clarence H Young 1415 Main St Little Rock
- CALIFORNIA Reciprocity San Francisco May 11 Los Angeles July 11 San Francisco Sept 14, and Los Angeles Nov 16 Written examinations Los Angeles March 7 10 San Francisco June 27 30 Los Angeles July 11 14 and Sacramento Oct 17 20 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento
- COLORADO Denver April 6 8 Sec Dr Harvey W Snyder 831 Republic Bldg Denver
- CONNECTICUT Medical (Regular) Hartford March 8 9 Endorsement Hartford March 22 Sec Dr Thomas P Murdock 147 W Main St Meriden Medical (Homeopathic) Derby March 8 Sec Dr Joseph H Evans 1488 Chapel St New Haven
- DELAWARE Dover July 12 14 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover
- DISTRICT OF COLUMBIA Basic Science Washington June 27 28 Medical Washington July 11 12 Asst Sec Commission on Licensure Mr Paul Foley 203 District Bldg Washington
- FLORIDA Jacksonville June 13 14 Sec Dr William M Rowlett Box 786 Tampa
- GEORGIA Atlanta June Joint Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta
- HAWAII Honolulu April 11 14 Sec Dr James A Morgan 48 Alexander Young Bldg Honolulu
- IDaho Boise April 5 6 Commissioner of Law Enforcement Hon J L Balderston 205 State Capitol Bldg Boise
- ILLINOIS Chicago April 5 7 June 28 July 1 and Oct 18 20 Superintendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield
- INDIANA Indianapolis June 21 23 Sec Board of Medical Registration and Examination Dr J W Bowers 301 State House, Indianapolis
- KANSAS Kansas City June 7 8 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N 7th St Kansas City
- KENTUCKY Louisville June 8 10 Sec State Board of Health Dr A T McCormack 620 S 3rd St Louisville
- MAINE Portland March 8 9 Sec Board of Registration of Medicine Dr Adam F Leighton 192 State Street Portland
- MARYLAND Medical (Regular) Baltimore June 21 24 Sec Dr John T O Mara 1215 Cathedral St Baltimore Medical (Homeopathic) Baltimore June 21 22 Sec Dr John A Evans 612 W 40th St Baltimore
- MASSACHUSETTS Boston March 8 10 Sec Board of Registration in Medicine Dr Stephen Rushmore 413 F State House Boston
- MICHIGAN Ann Arbor and Detroit June 15 17 Sec Board of Registration in Medicine Dr J Earl McIntyre 202 3-4 Hollister Bldg Lansing
- MINNESOTA Basic Science Minneapolis April 5 6 Sec., Dr J Charney McKinley, 126 Millard Hall University of Minnesota Minneapolis Medical Minneapolis April 19 21 Sec Dr Julian F Du Bois 350 St Peter St., St. Paul
- MISSISSIPPI Jackson, June Asst Sec State Board of Health Dr R N Whitfield Jackson
- MONTANA Helena April 5 6 Sec Dr S A Cooney 205 Power Block Helena
- NEBRASKA Basic Science Omaha May 3 4 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln
- NEW HAMPSHIRE Concord March 10 11 Sec Board of Registration in Medicine Dr Fred E Clow State House Concord
- NEW JERSEY Trenton June 21 22 Sec Dr James J McGuire 28 W State St Trenton
- NEW MEXICO Santa Fe April 11 12 Sec., Dr Le Grand Ward 135 Sena Plaza Santa Fe
- NEW YORK Albany, Buffalo New York and Syracuse June 27 30 and Sept 19 22 Chief Professional Examinations Bureau Mr Herbert J Hamilton 315 Education Bldg Albany
- NORTH CAROLINA Raleigh June 13 Sec Dr B J Lawrence 503 Professional Bldg Raleigh
- NORTH DAKOTA Grand Forks July 5 8 Sec Dr G M Williamson 4 1/2 S 3rd St Grand Forks
- OKLAHOMA Basic Science Oklahoma City May 4 Sec. of State Hon Frank C. Carter State Capitol Bldg Oklahoma City Medical Oklahoma City June 8 9 Sec Dr James D Osborn Jr Frederick
- OREGON Basic Science Portland March 19 Corvallis July 16 and Portland Nov 19 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene Medical Portland April 6 Sec Dr Joseph F Wood 509 Selling Bldg Portland
- PENNSYLVANIA Philadelphia and Pittsburgh July Sec Board of Medical Education and Licensure Dr James A Newpher 400 Education Bldg Harrisburg
- RHODE ISLAND Providence April 7 8 Chief Division of Examiners Mr Robert D Wholey 366 State Office Bldg Providence
- SOUTH CAROLINA Columbia June 28 Sec Dr A Earle Booser 505 Saluda Ave Columbia
- SOUTH DAKOTA July 19 20 Director of Medical Licensure Dr B A Dyar State Board of Health Pierre
- TEXAS San Antonio June 20 22 Sec Dr T J Crowe 918 Mercantile Bldg Dallas
- VIRGINIA Richmond June 22 24 Sec Dr J W Preston 30 1/2 Franklin Road Roanoke
- WEST VIRGINIA Huntington March 21 23 Sec Public Health Council Dr Arthur E. McClue State Capitol Charleston

WISCONSIN *Basic Science* Madison, April 2 Sec Prof Robert N Bauer 3414 W Wisconsin Ave., Milwaukee Medical Milwaukee June 28 July 1 Sec, Dr Henry J Gramling 2203 S Layton Blvd Milwaukee.

#### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners and Special Boards* were published in THE JOURNAL February 26, page 679

#### Pennsylvania Reciprocity and Endorsement Report

Dr James A Newpher, secretary, Board of Medical Education and Licensure, reports 8 physicians licensed by reciprocity and one physician licensed by endorsement from Nov 4 through Dec 3, 1937 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of California Medical School		(1933)	California
George Washington University School of Medicine		(1932)	Dist Colum
Howard University College of Medicine		(1932)	Maryland
University of Nebraska College of Medicine		(1932)	Nebraska
Western Reserve University School of Medicine		(1927)	Ohio
University of Pennsylvania School of Medicine		(1931)	N Carolina
Woman's Medical College of Pennsylvania		(1926)	New York
Medical College of Virginia		(1914)	Virginia
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Boston University School of Medicine		(1932)	N B M Ex

#### Missouri October Examination

Dr Herman S Gove, director of medical licensure, reports the written examination held in Kansas City, Oct 20-22, 1937 Twenty-five candidates were examined, 24 of whom passed and one failed The following schools were represented

School	PASSED	Year Grad	Per Cent
University of Arkansas School of Medicine		(1937)	76.9
Howard University College of Medicine	(1935) 82.9	(1936)	89.1
Northwestern University Medical School	(1935) 86.6	(1937)	85.2*
Rush Medical College		(1937)	85.3
School of Medicine of the Division of the Biological Sciences		(1937)	82.2
University of Illinois College of Medicine		(1937)	86.9*
University of Kansas School of Medicine		(1937)	81.5
University of Louisville School of Medicine		(1937)	85.3
St Louis University School of Medicine		(1936)	84.9
(1937) 79.2 83.4 85.3			
Washington University School of Medicine		(1937) 79.7	85.1
New York University College of Medicine		(1937)	86.5
Jefferson Medical College of Philadelphia		(1934)	82.2
University of Pennsylvania School of Medicine		(1937) 88.4	89.7
Medical College of Virginia		(1937)	83.3
University of Wisconsin Medical School		(1936)	80.9
School	FAILED	Year Grad	
Meharry Medical College		(1935)	

Forty-four physicians were licensed by reciprocity and six physicians were licensed by endorsement from October 19 through December 22 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1931)	Oklahoma
(1935) Arkansas			
Northwestern University Medical School	(1904)	(1929)	Illinois
Rush Medical College		(1901)	Nebraska
University of Illinois College of Medicine		(1937 3)	Illinois
Indiana University School of Medicine		(1936)	Indiana
Kansas Medical College, Kansas		(1913)	Kansas
University of Kansas School of Medicine		(1931)	
(1934 3) (1935) (1936 4) Kansas			
University of Louisville School of Medicine		(1936 2)	Kentucky
University of Michigan Homeopathic Medical School		(1890)	Kansas
St Louis College of Physicians and Surgeons		(1920)	Colorado
St Louis University School of Medicine		(1928)	Kansas
(1936) New York			
Washington University School of Medicine		(1910)	Nebraska
University of Nebraska College of Medicine		(1920)	Iowa
(1933), (1934) Nebraska			
Columbia Univ. College of Physicians and Surgeons		(1923)	New York
University of Buffalo School of Medicine		(1929)	New York
Hahnemann Med College and Hospital of Philadelphia		(1936)	Maryland
Lincoln Memorial University Medical Department Tennessee		(1916)	Kentucky
Meharry Medical College		(1933)	
(1934) (1936 4) Tennessee			
University of Tennessee College of Medicine		(1934)	
(1935 2) (1936) Tennessee			
University of Texas School of Medicine		(1936)	Texas
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
College of Medical Evangelists		(1937)	N B M Ex
Yale University School of Medicine		(1936)	N B M Ex
Northwestern University Medical School		(1936)	N B M Ex
St Louis University School of Medicine		(1936)	N B M Ex
Washington University School of Medicine	(1930)	(1936)	N B M Ex

\* This applicant has completed the medical course and will receive the M D degree on completion of internship License has not been issued

## Book Notices

**Crippled Children Their Treatment and Orthopedic Nursing** By Eul D McBride BS MD FACS Assistant Professor of Orthopedic Surgery University of Oklahoma School of Medicine Oklahoma City In collaboration with Winifred R Sink AB RN Educational Director Grace Hospital School of Nursing, Detroit Michigan Second edition. Cloth Price \$3.50 Pp 379 with 195 illustrations St Louis C V Mosby Company 1937

There are few satisfactory books dealing with the principle of orthopedic nursing, but this volume is one of them. The title indicates that the authors' primary interest was the nursing profession, but this book would be helpful and instructive as well as interesting reading for all who have the care and responsibility of crippled children, including medical social service workers, members of boards of managers of crippled children's hospitals, and the socially conscious lay public. The book is arranged in an orderly fashion. It begins with an introduction to the field of orthopedic surgery and a brief history of the development of this specialty and continues with a description of the type of work that is done, the facilities that are available and a discussion of the problem as a whole. The first nine chapters are largely confined to questions of special interest to orthopedic nurses. There is an adequate description of physical therapy and of braces and their care. The remainder of the book is concerned with brief descriptions of most of the conditions that cause crippling. It is possible that more is said about medical and surgical treatment than is entirely appropriate in a textbook of this type. However, at the end of each chapter the points of special nursing interest are listed in a 1 2 3 order. This should make the book exceedingly helpful to nurses who have not had adequate apprenticeships in hospitals where large numbers of orthopedic cases are cared for. If every general practitioner in the country would take the time to read this book, the value of his service as medical adviser to the families in the community in which he lives would be greatly increased. There would be less tendency on the part of some doctors to unwittingly mislead parents by telling them that their child would outgrow a limp or deformity which could be cured or improved only by application of modern orthopedic principles.

**Nurses Handbook of Obstetrics** By Louise Zabriskie RN Field Director Maternity Center Association New York City Fifth edition. Cloth Price \$3 Pp 724 with 381 illustrations New York & London J B Lippincott Company 1937

Miss Zabriskie has incorporated in this revised edition the newer phases of obstetric nursing. The author is eminently fitted by experience, accomplishments and sympathetic interest to write a nurses' handbook of obstetrics. She has been ably assisted by collaborators chosen for distinction in their special fields. Material selected from the leading and progressive maternity centers of the country makes the book a source of valuable information. The techniques and procedures demonstrated are practical and reliable. Especially noteworthy are the many original photographs, anatomic drawings, illustrations, roentgenograms, graphs and vital statistics, which clarify the text and eliminate lengthy descriptions. Related subjects are grouped together in units, giving coherence and continuity to the whole and making it especially effective for teaching purposes. The brief orientation introducing each unit familiarizes the student with the aim and content of the course. The basic facts underlying the practice of good obstetrics are forcibly and clearly presented. Beginning with the fundamental chapters on anatomy and physiology, the normal woman is brought through her pregnancy, labor and the puerperium with special emphasis on the prevention of obstetric complications. There is a comprehensive and authoritative discussion of the development and needs of the new-born infant and the hazards to which it is particularly susceptible at this critical period of its life. The subject of diet is considered in detail and its important effect on mother and baby during pregnancy and lactation. One of the valuable features of the book is the interesting and thought provoking article on the emotional factors of pregnancy and the role conditioning has in the behavior patterns of the infant. The busy practitioner will be able to utilize many of the worthwhile suggestions on home delivery and care. In the

unit the ecobolics, analgesics and anesthetics now in vogue are discussed. The important place x-rays are assuming in obstetric diagnosis and an excellent history of obstetrics are included. The author has discussed the most direct and telling methods used today to prevent deaths from toxemia, infection and accidents due to faulty diagnoses and mishandling. The book is not a mass of theory on controversial subjects but of factual knowledge and perfected methods that can be put to practical and effective use.

**The Therapeutic Problem in Bowel Obstructions. A Physiological and Clinical Consideration.** By Owen H. Wangenstein, B.A., M.D., Ph.D., Professor of Surgery of the University of Minnesota. Cloth. Price \$6. Pp. 360 with 90 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1937.

Recognition has already been extended this monograph, the first section of which has been awarded the Samuel D. Gross prize for 1935. The author has appended two more sections of about equal length, which go into greater detail than the prize-winning first portion. Essentially based on direct physiologic evidence obtained in the experimental laboratory and coupled with data obtained clinically, this piece of work is a fundamental contribution to surgery. While the first part deals only with laboratory observations and therapeutic applications in a general way, the latter portions are directed to specific clinical conditions. The author is a well-known exponent of decompression of the bowel by intubating duodenal suction. He explains his rationale for this procedure as well as the method of application. A firm proponent of the noxious effects of mechanical influences as against the older theory of absorbed toxins from the obstructed intestine, he presents his case well. Stress is laid on diagnosis, and x-ray examination is featured. All in all this is a profitable source for any surgeon called on to deal with the diseases of the abdomen.

**Crime Crooks and Cops.** By August Vollmer and Alfred E. Parker. Cloth. Price \$2. Pp. 260. New York & London: Funk & Wagnalls Company, 1937.

August Vollmer has a reputation gained as chief of police of Los Angeles and as professor of police administration at the University of California, which makes his contribution to the science of crime detection well worth while. It is of special interest to the medical profession because doctors frequently are concerned with examinations of the blood and hair, fingerprinting, personal identification and other aspects of this subject. The book here reviewed is based on actual cases, including among other items the use of the lie detector in several investigations and a consideration of its standing in court. The concluding chapters are concerned with the qualifications for police officers, which again are questions that might intimately concern members of the medical profession.

**L'exploration fonctionnelle du pancréas interne. A l'état normal dans le diabète sucré dans le diabète du jeûne et après insulinsulisation prolongée. Etude expérimentale et clinique.** Par le Dr René Saric. Paper. Pp. 238 with illustrations. Bordeaux: Librairie Delmas, [n.d.].

This is a monographic report of extensive investigation of the internal function of the pancreas by means of blood sugar time curves. The investigation covered tests made on normal dogs, dogs with complete and partial pancreatectomy and dogs with the pancreas intact, which had been treated for prolonged periods with insulin. Clinical diabetes of various types was similarly investigated before and after fasting and before and in the course of treatment with insulin. Microscopic examination of the pancreas of animals that had received insulin for several months revealed hyperplasia of the islands of Langerhans. Significant conclusions are that hyperglycemia is the physiologic excitant of the insular function but overloading with sugar is depressing to the islands the more so if they already are injured that treatment with insulin by a splinting effect causes normally an increase of insular tissue and increased amount of stored insulin that a regimen rich in carbohydrate without insulin brings on fatal aggravation of pancreatic injuries, while excessive treatment with insulin and permanent relative hypoglycemia diminishes the activity of the insular tissue. The happy mean which ought to represent ideal treatment should be sufficiently intense insulinization to protect the pancreas from being overloaded by the requirement of insulin

resulting from food taking, and a sufficient allowance of carbohydrate in the diet to maintain normal insular function. The monograph will appeal to physicians and experimentalists interested in the theory of diabetes.

**The Neurotic Personality of Our Time.** By Dr. Karen Horney. Cloth. Price \$3. Pp. 299. New York: W. W. Norton & Company, Inc., 1937.

The interested layman as well as the physician will find here a form of psychologic analysis built on the Freudian contribution but not essentially the same. Dr. Horney recognizes the great influence of our environment and culture on our points of view and on our mentality. Perhaps the most significant of the chapters in the work is the consideration given to the part played by sexuality in the neurotic need for affection. Certainly Dr. Horney reveals in this book a profound understanding of the nature of the neurosis and it is her conclusion that the person who is likely to become neurotic is the one who has experienced the culturally determined difficulties in an accentuated form, mostly through the medium of childhood experiences, and who has consequently been unable to solve them or has solved them only at great cost to his personality.

**Flying Vistas. The Human Being as Seen Through the Eyes of the Flight Surgeon.** By Isaac H. Jones, M.A., M.D., Medical Examiner, Bureau of Air Commerce, United States Department of Commerce. Cloth. Price \$2. Pp. 255 with illustrations. Philadelphia & London: J. B. Lippincott Company, 1937.

The relation and importance of physical fitness to aviation are aptly portrayed by the author in nontechnical language. An interesting story of the human being in his conquest of the air as seen through the eyes of the flight surgeon is unfolded. In the early days of aviation little thought was given to the man at the controls on whom must rest the successful performance of the most perfectly designed and constructed planes. The stress and strain on the nervous and circulatory systems were little understood and the high accident rate was promptly reduced when attention was drawn to the physical requirements of flying. The author describes the pioneering studies made during the war to support the human body in an unusual environment, as nature never intended that man should fly. The mounting toll of accidents directed attention to physical defects in the pilots and a basic rule was at once established that only the physically fit shall fly. After a searching general physical examination, studies were directed to the eyes, muscle balance, the ear as a dual sense organ, effects of diminished oxygen, muscular coordination and nervous reaction times, resulting in an examination outline which is the basis of the one in use today by the army, the navy and the department of commerce. A special chapter is devoted to blind flying and clearly explains its development and universal use in modern aviation—a distinct contribution from the flight surgeon. All who have flown, are flying and expect to fly should read this interesting book. It portrays preventive medicine in its highest form and reveals why "the planes go through."

**Medizinische Praxis. Sammlung für ärztliche Fortbildung.** Herausgegeben von Prof. Dr. L. R. Grote, leitender Arzt der medizinischen Klinik des Rudolf Hess Krankenhauses, Dresden. Prof. Dr. A. Fromme, Direktor der chirurgischen Abteilung des Stadtkrankenhauses, Dresden. Friedrichstadt und Prof. Dr. K. Warnekros, Direktor der staatlichen Frauenklinik zu Dresden. Band XLIV. Der Vitaminalhaushalt in der Schwangerschaft mit besonderer Berücksichtigung der Vitamine A und C. Von Dr. med. Gerhard Gaetgens, Universitätsfrauenklinik zu Leipzig. Paper. Price 12 marks. Pp. 161 with 21 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1937.

In this small book the author reviews the literature and his own studies on the vitamin requirements during pregnancy. He first discusses the metabolism of proteins, carbohydrates, fats, lipoids, ions and chlorides during pregnancy. He then considers the relationship of vitamins and hormones to the body metabolism. The greater portion of the book, however, is devoted to information concerning the importance of vitamins A and C in pregnancy. The author gives in great detail the chemistry, source, methods of detection, effects and results of lack of both of these vitamins for the nonpregnant. A special chapter is assigned to a discussion of vitamins A and C in pregnancy, and separate chapters are given over to the importance of these two hormones for the fetus and for lactation.



The author also discusses the antagonism between the thyroid gland and vitamins A and C and the effect of this on pregnancy and lactation. At the end of the book is a useful chart of foods and the amount of vitamins A, B<sub>1</sub>, B<sub>2</sub>, C, D and E which they contain. There is also an extensive bibliography. The book is well written and will serve admirably as a source of information for vitamins in general and for the vitamin requirements of pregnancy in particular. The price of the book is, however, ludicrously high for an unbound monograph containing twenty-one small charts.

**Practical Physiological Chemistry** By Philip B. Hawk, M.S., Ph.D., President of the Food Research Laboratories, Inc., New York City, and Olaf Bergheim, M.S., Ph.D., Associate Professor of Physiological Chemistry, University of Illinois College of Medicine, Chicago. In collaboration with Bernard L. Oser, Ph.D., Director of the Food Research Laboratories, Inc., New York City, and Arthur G. Cole, Ph.D., Assistant Professor of Physiological Chemistry, University of Illinois College of Medicine, Chicago. Eleventh edition. Cloth. Price \$8. Pp. 968, with 281 illustrations. Philadelphia: P. Blakiston's Son & Company, Inc., 1937.

This is the oldest American textbook in physiologic chemistry. Hawk was a student of Chittenden, who started the first laboratory of physiologic chemistry in the United States and, doubtless, many of the experiments have been elaborated by Chittenden or his students. Although more detailed laboratory work of Folin and Van Slyke has been collected in two other books, Hawk and Bergheim have supplied the most complete collection of selected laboratory methods, which include not only the chemistry of proteins, fats and carbohydrates but physical chemistry in relation to physiology. The main part of the book treats of the chemistry of tissues and foods, enzyme action and digestion, absorption, putrefaction and excretion, and respiratory metabolism (including calculations of total energy exchange) and hormones and vitamins. In the two latter groups chemical methods are used when possible, but biologic methods are described when chemical methods fail or are nonspecific. The book is in general well balanced, with few errors. Some points are not absolutely clear, for instance, it would appear to be implied on page 66 that methylphenylfructosazone is different from the corresponding glucosazone. The melting point is too low. On page 81 it seems implied that the main bulk of ingested agar passes into the feces, whereas a number of investigators have found that it is mainly decomposed by bacteria. On page 243, papaya is called paw-paw, which is an entirely different fruit. The formula for adenylypyrophosphate on page 779 does not seem possible. A method for the prevention of glycolysis in blood was not found but otherwise methods of analysis as well as preservation of specimens are rather completely covered.

**The American Medical Profession 1783 to 1850** By Henry Burnell Shafer, Ph.D., Number 417 Studies in History, Economics and Public Law. Edited by the Faculty of Political Science of Columbia University. Cloth. Price \$3.25. Pp. 271. New York: Columbia University Press, London: J. S. Kline & Son Ltd., 1936.

Here a competent medical historian surveys a period in the history of American medicine not adequately surveyed previously. The period concerned comprises that in which the American Medical Association was founded, the author's account of that event is most interesting. The concluding chapter deals with the developments in scientific medicine in the period concerned. In 1850 there were twenty-four medical journals in the United States, and just a few textbooks were being printed in this country. The volume concludes with the prediction of Samuel Gross, made in 1861, that a great new era was about to commence.

**A Text Book of Mental Deficiency (Amentia)** By A. F. Tredgold, M.D., F.R.C.P., F.R.S., Lecturer on Mental Deficiency, London University. Sixth edition. Cloth. Price \$7.50. Pp. 556, with 34 illustrations. Baltimore: William Wood & Company, 1937.

The fifth edition of this book appeared in 1929. In the intervening eight years there have been great advances, which the author has endeavored to reflect in his book. The volume is one of the best available on this subject and is useful both as a textbook and as a work of reference. One of the most fascinating chapters and one not usually seen in similar books on the subject is that headed "Idiot Savants."

**An Analysis of the De Generatione Animalium of William Harvey** By Arthur William Meyer, Professor of Anatomy, Stanford University. Boards. Price \$3. Pp. 167, with 11 illustrations. Stanford University: Stanford University Press, London: Oxford University Press, 1936.

While William Harvey is chiefly noted for his book entitled "De motu cordis," which concerns the circulation, the volume here discussed, and largely quoted as well, has aroused great interest and study among physicians throughout the world. It is essentially an early work in embryology and as such deserves medical consideration. Harvey was a philosopher as well as a scientist. It is interesting to know that more than 300 years ago he warned against meddling midwifery.

**Treatment in Psychiatry** By Oskar Diethelm, M.D., Professor of Psychiatry, Cornell University Medical College, New York. Cloth. Price \$4. Pp. 476. New York: Macmillan Company, 1936.

This volume is based on the principle that the patient rather than the symptoms requires treatment. It is a study of personality, including an excellent historical survey of various methods of procedure in psychiatry now available. The cases presented for analysis and study are found to be well selected and exceedingly interesting. The division of psychiatry into excitement and depression, schizophrenic reactions, and paranoid, delirious and toxic reactions is an indication of the new broad lines which govern psychiatry today. This volume is sufficiently direct in its concept and in its presentation to warrant its use by every physician who wishes to orient himself in this field.

**Physiology for Pharmaceutical Students** By Harold Hayden Barber, B.Sc., Ph.D., F.I.C., Head of the Sub Department of Physiology in the University College of Nottingham, Nottingham. Cloth. Price \$9. Pp. 477, with 132 illustrations. Baltimore: William Wood & Company, 1937.

This book attempts to give students of pharmacy an insight not only into physiology but also into pharmacology, which is indeed a happy combination to aim at in such a course. The book is especially noteworthy for its detailed description of laboratory exercises at the end of nearly every chapter. It must be regretfully admitted that there are few if any pharmacy schools in this country that give their pupils any such comprehensive course in physiology. Indeed, even the text in its general comprehensiveness would probably be "beyond" the comprehension of the average student in our pharmacy schools at present.

**Twins: A Study of Heredity and Environment** By Horatio H. Newman, Frank N. Freeman, and Karl J. Holzinger. Cloth. Price \$4. Pp. 369, with 72 illustrations. Chicago: University of Chicago Press, 1937.

In this volume, which is probably the most complete and most important study ever made of the biology, mentality and incidence of twins, a leading biologist, an educator and a statistician have combined. The book includes three parts devoted to the biology of twins, a comparison of fifty pairs of identical twins and fifty pairs of fraternal twins and, finally, a study of nineteen pairs of identical twins separated in infancy. The work concludes with a summary that indicates the extent to which character is determined by constitution and by environment, the final conclusion of the authors being that what heredity can do environment can also do. Notwithstanding the inability of the authors to state any positive conclusions, the study is of immense interest and highly suggestive for all concerned with similar questions.

**Ein Leben als Arzt der Seele. Erinnerungen** Von Albert Moll. Tübingen: J. C. B. Mohr, 1937. Price 3.37 marks. Pp. 282. Dresden: Carl Neisner Verlag, 1937.

The career of Albert Moll in psychiatry, in the field of hypnosis and in the study of sex is widely known through his great works on these subjects. Here he recapitulates the development of his scientific life. By this recapitulation he indicates how completely removed the scientist may be from the human being or the philosopher in any man.

**The Silver Kings of Aransas Pass and Other Stories** By Richard L. Sutton, F.R.G.S., Cloth. Price \$1. Pp. 352, with one illustration. Kansas City, Missouri: Brown White Company, 1937.

The amateur but ardent fisherman or sportsman will find these brief descriptions of the author's excursions with rod and gun of considerable charm. They form a collection of experiences during approximately twenty years from 1917 to 1937, and may tempt the reader to cast in new waters.



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts** *Insanity as a Compensable Injury*—In 1928 a car ran over the workman's right foot. The attending physician was unable to find any fracture or condition that would prevent the workman from returning to work. Nevertheless he quit work and developed what the record describes as a 'bad mental condition,' in which notions of injustice and persecution in connection with his claim for compensation which he filed predominated. A claim for compensation under the workmen's compensation act of Michigan was at that time denied. Subsequently, in 1934, he killed a man whom he thought was trying to steal papers relating to his claim and he was confined in a state hospital as a criminally insane person. His right leg had become weakened from disuse, partly at least arising out of his idea that he could not use it. His claim for compensation was again considered and an award was made by the department of labor and industry. The employer then appealed to the Supreme Court of Michigan.

That the workman had become worse, both physically and mentally, said the court, since the hearing was undisputed. The present case posed the question as to whether and when disability arising from a mental disorder growing out of an accident is compensable. The authorities plainly indicate, the court said, that where the accident has a direct effect on the nervous system, all the results thereof, both physical and mental, go to make up disability and determine compensability. Where, however, the mental disturbance is collateral to the injury and is due to worry, anxiety or brooding over the accident or its effect on compensation for it, it is not compensable. In the present case, the court said, the distinction was not kept in mind in the presentation of testimony or in the opinion of the commission. It found the fact of total disability without a proper regard for the applicable rule of law. The issue was whether and how far the workman's disability was the direct result of the physical injury to his foot, excluding the consequences of mental disturbances collateral to and not arising directly from the physical hurt. Since this issue was not adjudicated by the commission, the Supreme Court vacated the award and remanded the case for the reconsideration of the commission.—*Schneider v Cadillac Motor Car Co (Mich)*, 273 N W 418.

**Medical Practice Acts** *Use of Title "Doctor" by Drugless Healer as Cause for Revocation of License*—In 1924 the defendant, Wicker, was granted a license by the Michigan state board of medical registration in medicine to practice a system of treatment of human ailments or diseases without the use of drugs. The provisions of the medical practice act under which Wicker was licensed denied him the right to use the title "Doctor." In 1936 a notice was served on Wicker requesting him to appear before the board and show cause why his license should not be revoked or suspended (1) because of his having used the title 'Doctor,' (2) because of his having exceeded and violated the terms and conditions under which he was licensed, and (3) because of his having represented himself to be qualified to practice medicine. Following the hearings the board revoked the license and Wicker appealed to the Supreme Court of Michigan.

The testimony showed that Wicker was an ordained minister of the Christian Spiritualist Association. His healing methods were both religious and drugless, the latter performed by manipulation of the muscles and nerves of the patient's body. After the testimony had been concluded, the board found Wicker guilty of "(1) using the title 'Dr,' representing himself as a physician, (2) advertising of grossly improbable statements, (3) failing to limit his practice to the scope of authority conferred." But said the Supreme Court the notice served on

Wicker did not contain a charge that he was guilty of the "advertising of grossly improbable statements." A physician cited to appear and answer specific charges should not be charged with one type of misconduct and on hearing be convicted of another and wholly different type of misconduct not contained within the charges made and served on him. For this reason the revocation of Wicker's license on this ground could not be sustained. Furthermore, the notice served on Wicker charged him with having exceeded and violated the terms and conditions under which he was licensed to practice by administering treatments not within the scope of his license. With respect to this charge, said the Supreme Court, it must first be noted that it was not sustained by any testimony and, secondly, that it was too indefinite to be used as the basis of a lawful hearing of this character.

A careful review of the record convinced the court that the only charge established against the defendant which was sufficiently stated in the notice served on him was that he unlawfully used the title "Doctor." As a matter of fact, such use was admitted but Wicker contended that this use did not constitute a ground on which the board could base its revocation order. While the provisions of the act under which Wicker was licensed specifically denied him the right to use the title "Doctor" the provisions of the medical practice act specifying the causes for which a license could be revoked neither expressly nor by fair implication included the improper use of the title "Doctor." It follows, the court said, that the board, a purely statutory body having only statutory powers was without authority to suspend or revoke the defendant's license because of his improper use of the title "Doctor." The order of the board of registration in medicine revoking the defendant's license was therefore set aside.—*State Board of Registration in Medicine v Wicker (Mich)*, 274 N W 343.

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Mobile Apr 19 21 Dr D L Cannon 519 Dexter Ave Montgomery Secretary
- American Association for Thoracic Surgery Atlanta Ga Apr 4 6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary
- American Association of Anatomists Pittsburgh Apr 14 16 Dr George W Corner 260 Crittenden Blvd Rochester N Y Secretary
- American Association on Mental Deficiency Richmond Va Apr 20 23 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary
- American Bronchoscopic Society Atlantic City N J Apr 30 Dr Lyman Richards 319 Longwood Ave Boston Secretary
- American College of Physicians New York Apr 4 8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary
- American Laryngological Rhinological and Otolological Society Atlantic City N J Apr 27 29 Dr C Stewart Nash 277 Alexander St Rochester N Y Secretary
- American Physiological Society Baltimore Mar 30 Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary
- American Society for Experimental Pathology Baltimore Mar 30 Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary
- American Society for Pharmacology and Experimental Therapeutics Baltimore Mar 30 Apr 2 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary
- American Society of Biological Chemists Baltimore Mar 30 Apr 2 Dr H A Matull Chemistry Bldg State University of Iowa Iowa City Secretary
- American Therapeutic Society New York Apr 12 Dr Oscar B Hunter 1835 Eye St N W Washington D C Secretary
- Arizona State Medical Association Tucson Apr 21 23 Dr D I Harbridge 15 East Monroe St Phoenix Secretary
- Arkansas Medical Society Texarkana Apr 18 20 Dr W R Brooksher 602 Garrison Ave Ft Smith Secretary
- Federation of American Societies for Experimental Biology Baltimore March 30 April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
- Georgia Medical Association of Augusta Apr 26 29 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore Apr 26 27 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary
- Mississippi State Medical Association Jackson Apr 19 21 Dr T M Dye McWilliams Bldg Clarksdale Secretary
- Nebraska State Medical Association Lincoln Apr 26 28 Dr R B Adams Center McKinley Bldg Lincoln Secretary
- Philippine Islands Medical Association Zamboanga City Apr 19 22 Dr A S Fernando 817 Taft Ave Manila Secretary
- Southeastern Surgical Congress Louisville Ky March 7 9 Dr B T Beasley 701 Hurt Bldg Atlanta Ga Secretary
- Tennessee State Medical Association Nashville Apr 12 14 Dr H H Shoulders 706 Church St Nashville Secretary

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

*Tenth Annual Meeting Held in Chicago Nov 5 and 6 1937*

The President, DR DAVID P BARR, St Louis, in the Chair

*(Continued from page 688)*

### Severe Anemia in Puppies on a Synthetic Diet Deficient in Rat Antidermatitis Factor (Vitamin B<sub>6</sub>)

DRS PAUL J FOUTS, Indianapolis, O M HELMER, Indianapolis, SAMUEL LEPKOVSKY, Berkeley, Calif, and THOMAS H JUKES, Berkeley, Calif Puppies grew satisfactorily on a diet composed of casein, sucrose, crisco, bone ash and salt mixture 185 when supplemented with halibut liver oil, vitamin B<sub>1</sub>, either crystalline or a vitamin B<sub>1</sub> concentrate prepared by the method of Stuart, Block and Cowgill, riboflavin, liver filtrate containing chick antidermatitis factor or filtrate factor, and a rice polish extract containing the rat antidermatitis factor (vitamin B<sub>6</sub>). However, the puppies on this diet similarly supplemented except for the absence of the rice polish extract (vitamin B<sub>6</sub>), which had been shown to be free from both riboflavin and the filtrate factor, not only did not show proper growth but developed a severe microcytic hypochromic anemia often associated with neurologic symptoms. This anemia did not respond to an increase of iron in the diet. The addition of the rice polish extract to the diet produced a reticulocytosis followed by a rapid increase in weight, red blood cell count and hemoglobin percentage. The puppies on this diet and all the supplements but the liver filtrate factor developed signs and symptoms of blacktongue.

#### DISCUSSION

DR CHARLES A DOAN, Columbus, Ohio Were white counts and platelet counts done in the dogs with vitamin B<sub>6</sub> deficiency?

DR PAUL J FOUTS, Indianapolis The white counts were not remarkable. There might have been a slight decrease from the original count of 15,000 or 20,000 to 13,000, 12,000 or 11,000. The platelets were not counted but there did not appear to be a decrease on the smear.

### Yellow Bone Marrow in the Treatment of Agranulocytic Angina and Secondary Granulocytopenia

DRS C H WATKINS and H Z GIFFIN, Rochester, Minn During experimental studies with the administration of bone marrow for secondary anemia in 1928 and 1929, a moderate increase in the number of monocytes and neutrophils was observed in blood smears. This observation led to the administration of bone marrow in cases of granulocytopenia. The first case of agranulocytic angina was treated with bone marrow in July 1930. Since then more than twenty cases have been treated with bone marrow, with no other treatment aside from nursing care. During the acute stage from 200 to 400 grains (13 to 26 Gm) of bone marrow was given daily, one patient took as much as 800 grains (52 Gm) daily. As monocytes and polymorphonuclears appeared in the blood smears the dose was decreased. Death occurred in only three of those cases in which an adequate amount of bone marrow could be ingested, and in these cases there were severe complications. In every case in which an adequate amount of bone marrow could be administered and in which complications were not overwhelming there was a favorable reaction in the blood and general condition of the patient with recovery from the attack.

#### DISCUSSION

DR S MILTON GOLDFRAMER Ann Arbor Mich Since Madison and Squier demonstrated that aminopyrine was a causative agent in agranulocytic angina, other investigators have shown a similar relationship to agranulocytosis with such drugs as gold compounds, dinitrophenol and sulfanilamide. Before any specific etiologic factor was determined the majority of patients with this disease died. However with the elimination of the drug which produced agranulocytosis there have been very few deaths regardless of the type of supportive therapy used. It appears from these facts that the important feature of treatment is the removal of the cause. I wonder whether the results of Drs Watkins and Giffin may not be

attributed to the removal of the etiologic factor as well as to the oral administration of yellow bone marrow.

DR CHARLES A DOAN, Columbus, Ohio Were any extensive bone marrow studies made in addition to the blood studies before and after treatment?

DR TOM D SPIES, Cleveland How was an adequate dose determined? How was the bone marrow given?

DR C H WATKINS, Rochester, Minn Most of these cases of agranulocytosis were treated before it was suspected that aminopyrine and other similar substances were important etiologic factors. In some instances the use of aminopyrine was continued throughout the time the patient was under treatment. In certain other cases we have been able to eliminate the possibility of any of these drugs being used and yet have noticed a rapid remission in the disease with bone marrow. We have more or less arbitrarily, as a result of experience, selected 300 grains (20 Gm) of bone marrow extract daily as the average dose. In mild leukopenic states smaller doses of from 75 to 100 grains (5 to 6.5 Gm) have been given. In severe leukopenic states as much as 800 grains (52 Gm) daily has been given. If there is no improvement in the leukocyte count and no evidence of monocytes in the peripheral blood following the initial dose of 300 grains (20 Gm) the dose is increased usually to 400 or 500 grains (26 to 32.5 Gm) daily until some change is noted in the peripheral blood. We have not studied the changes in the bone marrow in this group. This would be of great interest during the recovery phase of the disease and it would also be of interest to note whether the state of the bone marrow at the time the administration of bone marrow extract is started has anything to do with the type of response obtained.

### Administration of Nicotinic Acid to Pellagrins

DRS TOM D SPIES, CLARK COOPER and M A BLANKEN HORN, Cincinnati Since pellagra in human beings and black tongue, in dogs are often regarded as closely related diseases, and since Elvehjem and his associates had reported the cure of canine blacktongue by the use of nicotinic acid, it seemed worth while to determine whether this substance would be beneficial in the treatment of human pellagra. Preliminary observations showed that nicotinic acid could be given safely either orally or parenterally. Four pellagrins were selected for study. Two were male chronic alcoholic addicts with characteristic pellagrous dermatitis, glossitis and stomatitis. The third was a female chronic alcoholic addict with pellagrous dermatitis, glossitis, stomatitis and vaginitis. The fourth a woman, did not use alcohol but acquired pellagrous dermatitis, glossitis, stomatitis and vaginitis following subsistence on a deficient diet over a period of five years. On admission to the hospital each patient was placed under controlled conditions. During the test period the three patients whose pellagra followed chronic alcoholic addiction received only small amounts of a basic (pellagra-producing) diet and nicotinic acid. Two of these patients, who had involvement of the nervous system received crystalline vitamin B<sub>1</sub> in addition to the basic diet and nicotinic acid. The fourth patient, whose disease was unassociated with alcoholic addiction, was so ill that she was unable to eat any food. She received only parenteral injections of nicotinic acid, crystalline vitamin B<sub>1</sub>, saline solution and dextrose until the stomatitis and glossitis had definitely improved. Within twelve hours after the administration of nicotinic acid the oral lesions of all four pellagrins, as well as the vaginal lesions of the two women, were distinctly less red. One man whose disease followed chronic alcoholic addiction continued to eat the basic diet for three weeks and received 50 mg of nicotinic acid three times each day by mouth. There was no return of the dermal or oral lesions of pellagra. This study shows that the fiery red color associated with the pellagrous dermatitis, glossitis, stomatitis and vaginitis of these four patients improved under the conditions of this study. Although it must be admitted that observations on pellagrins during the past seven years have shown that the lesions of an occasional pellagrin disappear while he is taking a basic pellagra-producing diet the pellagrins in whom such spontaneous remissions have been observed have not been as severely ill nor did their symptoms improve as promptly as did the ones in the present study.

## DISCUSSION

DR PAUL J FOUTS, Indianapolis About a year ago Drs Lepkovsky, Helmer, Jukes and I reported the successful treatment of pellagra with a filtrate factor which is similar to that from which the group at Wisconsin isolated nicotinic acid. We had four patients recently treated with nicotinic acid with as satisfactory results as Dr Spies and his co-workers obtained.

DR JOHN W MOORE, Louisville, Ky I should like to ask about the skin lesions.

DR M A BLANKENHORN, Cincinnati In one of the most acute cases there were severe lesions of the tongue and the vagina. The patient was unable to eat. We gave her only water and nicotinic acid. The vaginal lesions which were so fiery red cleared up as well as the lesions of the tongue.

DR MOSES BARRON, Minneapolis What is the dose of nicotinic acid in the treatment of these cases?

DR TOM D SPIES, Cincinnati Since Dr Fouts and his co-workers have been so unusually successful in their work in the field of deficiency diseases, it is particularly gratifying that their results are in agreement with our own. In answer to Dr Moore's question, the four pellagrins we described did have typical pellagrous dermatitis. However, I would hesitate to say what effect the nicotinic acid might have had on the skin lesions. We have shown previously that the skin lesions are never static and that the tendency to improve is strong even though the patient may eat a pellagra-producing diet. It will take further studies in order to settle this pertinent point. We purposely avoided mentioning dosage, as it is still in the experimental stage. We have given a pellagrin as much as 0.5 Gm daily without ill effects. Healing of the glossitis and stomatitis of several of the pellagrins occurred on much smaller amounts of nicotinic acid. We have no information, however, as to what the minimal effective dose for these patients might have been.

### The Iodine Balance in Exophthalmic Goiter

DRS ITALO D PUPPEL and GEORGE M CURTIS, Columbus, Ohio Three normal persons on a low iodine intake averaging 87 micrograms to each three day period remained in continuous negative iodine balance. Three patients with exophthalmic goiter maintained on a similar low iodine intake revealed an increased mobilization of iodine, an increase in its circulation, and an increase in its excretion through one or all excretory channels. This resulted in a profound disturbance of the iodine balance. Increased iodine feeding to a normal person produced an immediate positive iodine balance. Similar increased iodine feeding to a hyperthyroid patient resulted in an immediate tremendous retention of iodine with a positive iodine balance, which was twice the normal. The increased negative iodine balance of hyperthyroidism returned to within normal limits subsequent to adequate thyroid surgery.

## DISCUSSION

DR ROBERT W KEETON, Chicago Are there criteria to determine iodine saturation other than decrease in metabolic rate?

DR M A BLANKENHORN, Cincinnati Is there any difference in the terms of iodine output in that phase of the disease which is said to be an "escape" from iodine control? When iodine is given a patient with thyrotoxicosis and the patient improves sooner or later the improvement ceases. Have you information concerning the effect of iodine in that phase of the disease?

DR ITALO D PUPPEL, Columbus, Ohio Our iodine balance researches have not extended as yet into problems concerned with iodine saturation and escape from iodine control during the iodine treatment of exophthalmic goiter. Iodine metabolism investigation of the latter phases of iodine therapy should prove of the greatest interest.

### The Treatment of Hypoparathyroid Tetany with Dihydrotachysterol

DR CYRIL M MACBRYDE, St Louis Studies were presented of four patients with parathyropivic tetany relieved by dihydrotachysterol. The results with the various combinations of the usually accepted methods of treatment including large doses of calcium by mouth, acid salts, viosterol, low phosphorus

diets and parathyroid extract, were compared with the response to the new drug. In these patients, all previously under treatment for some years, the usual medications have been unsuccessful in preventing the development of cataracts. One patient developed severe epileptiform convulsions. The new medication has for the first time made it possible to achieve and maintain normal blood calcium levels and to relieve symptoms completely. Two of these patients have had approximately normal blood calcium and no symptoms for nine months and the other two for three months each. It seems advisable, although not absolutely necessary, to give small doses of calcium with the dihydrotachysterol. It must be emphasized that this very potent preparation should not be used indiscriminately. Excessive doses have been shown to result in decalcification of bone of experimental animals and greatly increased urinary calcium, metastatic calcification, severe gastro intestinal upsets, and bleeding from the bowel. Studies with this drug should be undertaken only with the greatest of care. Frequent determination of serum calcium is necessary. It seems probable that this fraction of irradiated ergosterol will prove of considerable importance in the treatment of hypoparathyroidism. Certainly no other preparation in our hands has given such excellent results in the treatment of tetany. Calcium and phosphorus balance studies were done on two patients to investigate the mode of action of the dihydrotachysterol on calcium and phosphorus metabolism. In these preliminary studies we were unable to demonstrate an increased absorption of calcium with the drug. Further studies are being pursued along this line.

## DISCUSSION

DR W S MIDDLETON, Madison, Wis I will add two cases using A T-10 (dihydrotachysterol) that we have had at Madison, one with latent tetany of three years' duration and the other an acute tetany of a month's duration. In both with maintenance doses of 1 cc the patients remained free from symptoms and maintained satisfactory blood calcium levels.

DR W E POST, Chicago Over how long a period is the administration of dihydrotachysterol continued?

DR WILLIAM S HOFFMAN, Chicago The rise in serum calcium after dihydrotachysterol seems all the more dramatic in that it took place with a high intake of phosphorus. I should like to ask in this connection whether the authors have tried to use a very low phosphorus diet without dihydrotachysterol, in view of Shelling's reported success in managing tetany this way.

DR E P MCCULLACH, Cleveland The action of this material is remarkable in many ways, not only in its power to raise the blood calcium but in the great similarity of its action to parathyroid extract itself. The studies on the blood calcium show that it not only raises the serum calcium levels but has a tendency to lower the blood phosphorus considerably. Caution is needed in using this substance. A daily dose tends to accumulate in its activity over a few days, so that the rise in serum calcium that takes place tends to continue, particularly if the first few doses are large. I wonder whether the amount of calcium that is apparently thrown out of the system under the action of this material, being similar to the action of parathyroid extract may not be another reason for extreme caution in the use of this potent drug.

DR CYRIL M MACBRYDE, St Louis The drug must be continued in small maintenance doses to keep the blood calcium at normal levels. Our patients are taking from 0.25 to 0.75 cc daily, with a calcium intake ranging from 2 to 10 Gm of calcium lactate or gluconate. The phosphorus intake averaged about 1 Gm daily in these patients. During these studies no attempt was made to restrict greatly the phosphorus ingested. Previously, however, several of the patients have had low phosphorus diets which would seem to be somewhat helpful in their treatment. When A T-10 (dihydrotachysterol) is used there seems to be no necessity for severe restriction of the phosphorus intake. After the drug was started there was a gradual increase in both blood phosphorus and blood calcium. Then as the calcium continued to rise there was a tendency for the blood phosphorus to fall. The apparently cumulative effect of the drug is important. The drug exerts its action over a period of days or weeks and it takes several days for any marked effect to appear. In a

week or two the blood calcium reaches normal levels on doses of from 0.5 to 2 cc a day. Holtz gave 10 cc the first day, 5 the second day and 2 every day thereafter. Such large doses do not seem to be necessary and we have not used them because of the danger of producing hypercalcemia.

#### Experimental Insulin-Sensitive and Insulin-Insensitive Diabetes

DRS SAMUEL SOSKIN and R. LEVINE, Chicago. The differentiation between the insulin-sensitive (juvenile or unstable) type of diabetes and the insulin-insensitive (adult or stable) type is of considerable clinical interest. The insulin-insensitive type has been found to give a better response than the other to high carbohydrate diets. From the theoretical standpoint the resemblance of the insulin-sensitive type to the depancreatized animal has led to the suggestion that this type of diabetes is probably due to a lack of endogenous insulin, while the insulin-insensitive type has been ascribed to extrapancreatic disturbances. We have been able to reproduce both types of diabetes in the same completely depancreatized dog, at different times. There was no endogenous supply of insulin at either time. The significant difference between the two types of diabetes has been found to depend on the functional capacity of the liver.

#### DISCUSSION

DR W. S. HOFFMAN, Chicago. Can the response of the blood dextrose concentration to the injection of insulin be used as an index of liver function?

DR MOSES BARRON, Minneapolis. The result seemed excellent with pancreatic feedings in depancreatized dogs. May there not be specific changes in the liver as a result of the pancreatic feedings, and may not that change the sugar tolerance? Feedings other than pancreas should be tried.

DR E. P. McCULLACH, Cleveland. It has been well known for a long time that depancreatized animals finally do go into hypocalcemia if not fed pancreas, and the same phenomenon can be prevented if they are fed lecithin and similar substances. I wonder whether Dr. Soskin believes that the stable type of diabetes in man is the result of fatty metamorphosis such as takes place in animals.

DR CYRIL MACBRYDE, St. Louis. I am gratified that Dr. Soskin has been able to confirm our observations distinguishing the two main types of diabetes—the relatively insulin resistant and the relatively insulin sensitive. Continued observations on the previously reported group of patients and a number of other patients since added to our studies have confirmed our belief that the insulin sensitive type of patient shows little or no gain in carbohydrate tolerance no matter what type of diet he takes. On the other hand, the insulin-resistant type shows a definite tendency to gain tolerance, especially if allowed a high carbohydrate intake. I believe that Dr. Soskin's studies revealing the importance of the liver may show the usual cause of the relative insulin resistance seen in at least half of our diabetic patients. There are, of course, other features which may be important in reducing the effectiveness of endogenous or exogenous insulin. The dramatic effects sometimes following the removal of adrenal tumors or the treatment of pituitary lesions afford examples of factors which are probably more infrequent.

DR SAMUEL SOSKIN, Chicago. In reply to Dr. Hoffman's question the hypoglycemic effect of insulin probably could be used as a test of liver function with about as much justification as many other liver function tests. However, like these other function tests it would give information about only one of the many functions of the liver and, in addition, it would be subject to many extrahepatic influences that are difficult to control. As regards Dr. Barron's question concerning the production of fatty changes in the liver by means other than omitting the raw pancreas from the diet of our depancreatized dogs we expect to have such data before this work is completed. There is of course the possibility that fatty changes and liver dysfunction produced by other means might not be accompanied by similar changes in the character of the diabetes. However, in my opinion, this possibility is remote. Dr. McCullach's question concerning the possibility that the stable type of human diabetic patient has a fatty liver is a good one. In this connection the efficacy of the high fat diet in controlling diabetic manifestations has puzzled me for a

long time. While this was quite in line with the older ideas on diabetic metabolism, it is difficult to explain on the basis of our newer knowledge. It may be that the moderate fatty infiltration of the liver caused by high fat diets accounts for the beneficial effects of this treatment. Anything that mildly limits the functional capacity of the liver will similarly cause apparent improvement of the diabetes. However, these remarks are speculative and remain to be proved. Regarding Dr. MacBryde's work showing that the insulin sensitive diabetic patient shows no gain in tolerance on any diet, that is quite consistent with our results. The sensitive or juvenile type of diabetic patient, with a normal liver, responds maximally to insulin. Thus one would not expect to be able to improve his tolerance, as judged by his insulin-dextrose equivalence, by any form of diet. In the adult type of patient with diabetes there is a reduced liver function. Hence a high carbohydrate diet by improving liver function, will increase its responsiveness to insulin, and the insulin-dextrose equivalent is increased.

#### Influence of Insulin on Protein Metabolism

DR I. ARTHUR MIRSKY, Cincinnati. Although much is known concerning the role of insulin in carbohydrate and fat metabolism, its function in protein metabolism is still problematic. In a series of experiments performed with fasted normal and eviscerated dogs, we have obtained data which indicates that insulin always decreases the rate of protein metabolism. This is accomplished by two mechanisms: (1) inhibition of hepatic deamination and (2) increased utilization of amino acids by the muscles. Data were also obtained which revealed that increasing the amino acid content of the blood to high levels results in a diminution in amino acid elimination by the muscle. These studies suggest that insulin may be of therapeutic value in muscular wasting diseases of various kinds.

#### DISCUSSION

DR SAMUEL SOSKIN, Chicago. This study points to a further departure from the old view regarding insulin. Physicians have been gradually getting away from the idea that insulin is a hormone which promotes a specific effect (oxidation) in a single organ (muscle) and have come to regard it as more general both in its effects and in its locus of action. This work shows that we must now enlarge our point of view still more, to include protein as well as carbohydrate metabolism. I should be interested to know what success Dr. Mirsky has had with the insulin treatment of muscular dystrophies.

DR E. H. RYNEARSON, Rochester, Minn. Until protamine insulin became available, most men interested in the treatment of diabetes made every effort to keep the urine of diabetic patients free from sugar. Since the advent of protamine insulin some men have been regarding glycosuria as a postprandial glycosuria and feel that this is not a manifestation of destruction of the patient's endogenous stores. I should like to ask Dr. Mirsky whether his studies have indicated any greater nitrogen-sparing action with protamine insulin than with regular insulin.

DR I. ARTHUR MIRSKY, Cincinnati. In anticipation of Dr. Soskin's question, I have prepared a slide which indicates some of the possible uses of insulin in this respect. However, I must stress that our studies are still in the early experimental stages. We find it difficult to obtain an adequate number of cases. Monat in 1935 administered 10 units of insulin daily to a patient with progressive muscular dystrophy, and with a gain in the weight of his patient he reported encouraging results. Within the past forty-eight hours it has come to my knowledge that Meldolesi has been using insulin together with pancreatin in cases of progressive muscular dystrophy. He also reports encouraging results. At the onset of our studies we could not obtain any cases of progressive muscular dystrophy but did study several cases of myasthenia gravis. We now have three cases of myasthenia gravis under observation. The slide reveals that during the insulin period of treatment the general muscular power of a patient suffering from myasthenia gravis improved about 600 per cent. With the cessation of insulin therapy the muscle power returned to its previous low state. This work is still in the early stages of experimentation. Our studies to date indicate that insulin may be of value in myasthenia gravis as well as in other muscular dystrophies.

(To be continued)

## Current Medical Literature

### AMERICAN

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#### American Journal of Cancer, New York

31 537 710 (Dec) 1937

- Papillomatosis in Forestomach of Rat and Its Bearing on Work of Fibiger W Cramer London England—p 537  
Kaposi's Sarcoma D S D Jessup New York—p 556  
Congenital Xanthoma Tuberosum H Charache Brooklyn—p 563  
Comparison of Cytoplasmic Changes Induced in the Walker Rat Carcinoma 256 by Different Types and Dosages of Radiation I Golgi Apparatus L C Fogg and S Warren Boston—p 567  
Id II Mitochondria L C Fogg and S Warren Boston—p 578  
Life Expectancy and Incidence of Malignant Disease IV Carcinoma of Genito Urinary Tract C E Welch and I T Nathanson Boston—p 586  
Id V Malignant Lymphoma Fibrosarcoma Malignant Melanoma and Osteogenic Sarcoma I T Nathanson and C E Welch Boston—p 598  
\*Attempt to Induce a Specific Immunity to Transplantable Neoplasms L Gross Paris France—p 609  
Urine Chemistry in Diagnosis of Embryonal Tumors S E Owen Q G Polanco and L H Prince Hines Ill—p 613

**Immunity to Transplantable Neoplasms**—Gross avers that neoplasms induced in mice rabbits and chickens by intracutaneous inoculation of emulsions of the Ehrlich sarcoma, Brown-Pearce rabbit carcinoma and Rous sarcoma, respectively, sometimes regressed spontaneously and the animals thereafter displayed a specific generalized immunity to inoculation with those tumors, which however, was not transferable by blood serum or organ emulsions to other animals. Regression following subcutaneous inoculation of similar doses was unusual.

#### American Journal of Diseases of Children, Chicago

55 1 230 (Jan) 1938

- Studies of Fetal Respiratory Movements I Historical and Present Day Observations B E Bonar C M Blumenfeld and C Fenning Salt Lake City—p 1  
\*Influence of Vitamin C on Diphtheria Toxin Jean Pakter and B Schick New York—p 12  
Metabolic Study of Five Children with Nephrotic Syndrome I Report on Certain Constituents of Blood Basal Metabolism and Energy Exchange A G Mitchell C R Rittershofer Chi Che Wang Mildred Kaucher Mary Wing and Corinne Hogden Cincinnati—p 27  
Measurement of Obesity by Creatinine Coefficient N B Talbot with the assistance of Frances Broughton Boston—p 42  
Results of Schick Test in 5 195 Children Given Injections of Diphtheria Toxoid B Benjamin G Fleming Montreal and Mary A Ross Toronto—p 51  
\*Influence of Tonsillectomy on Rheumatic Infection Rachel Ash Philadelphia—p 63  
Role of Advanced Maternal Age in Causing Mongolism Study of 2 822 Cases A Bleyer St Louis—p 79  
Hypertrophy of the Heart in Infants H E MacMahon Boston—p 93  
Gonadotropic Principle in Treatment of Cryptorchidism Review of Literature J A Bigler Highland Park Ill L M Hardy Chicago and H V Scott Fort Wayne Ind—p 100  
Sclerema Neonatorum (Subcutaneous Fat Necrosis) J F McIntosh T R Waugh and S G Ross Montreal—p 112  
Objective Ratings of Constitution of the Growing Child Based on Examination of Physical Development and Mental Expansion T W Todd Cleveland—p 149

**Influence of Vitamin C on Diphtheria Toxin**—Pakter and Schick studied the influence of vitamin C on diphtheria toxin in a series of children who were known to react positively to Schick tests done at varying intervals after the administration of cevitic acid. All modes of administration—oral, intravenous, intramuscular, subcutaneous and intracutaneous—were tried. With all the vitamin C was found to be ineffective if judged by the persistence of undiminished positive reactions to

the Schick test even after doses as high as 1,100 mg were given intravenously. A slight neutralizing effect of vitamin C was observed when it was mixed with diphtheria toxin in vitro and then injected intracutaneously. This effect was more apparent the longer the mixture was allowed to stand. The neutralizing effects of vitamin C are probably due to nonspecific inactivation brought about by changes in the  $pH$  or by alterations due to changes made by the acid in the oxidation-reduction system or to both factors. A capillary effect due to vitamin C may be possible.

**Influence of Tonsillectomy on Rheumatic Infection**—In view of the conflicting opinions, Ash made a study of the influence of tonsillectomy on the 532 rheumatic children who had come under observation in the ward or the cardiac disease clinic from 1922 to 1936. In eleven cases no definite information could be obtained from the records as to the presence or absence of tonsils at the time of the original infection, in ninety-six the tonsils had already been removed at the time of the first rheumatic manifestation and in 425 they were still present. Tonsillectomy did not prevent recurrences of rheumatic manifestations. Neither the presence nor the absence of tonsils at the time of the initial infection nor the removal of tonsils subsequent to the onset had any demonstrable influence on the incidence of cardiac involvement or the death rate. A tonsillectomy performed early in the course of the disease was followed immediately by a high incidence of rheumatic exacerbations. Tonsillectomy for the rheumatic child seems to be indicated only when there is definite evidence of disease in the tonsils and not as a routine procedure. The operation should be performed only during an inactive phase of the infection.

#### American Journal of Medical Sciences, Philadelphia

195 1 140 (Jan) 1938

- Placenta as Modified Arteriovenous Fistula Considered in Relation to Circulatory Adjustments to Pregnancy C S Burwell Boston—p 1  
Serial Blood and Bone Marrow Findings of an Eight Month Premature and Its Roentgen Ray Treated Chronic Myeloid Leukemic Mother L A Erf and A Fine Cincinnati—p 8  
Macrocytic Anemia in Cancer of Stomach Apparently Due to Lack of Intrinsic Factor S M Goldhamer Ann Arbor Mich—p 17  
Character of Leukocytic Response to Tuberculin in Sensitized Calves J Stasney and W H Feldman Rochester Minn—p 20  
Etiologic Relation of Eosinophil to Gordon Phenomenon in Hodgkin's Disease J C Turner H Jackson Jr and F Parker Jr, Boston—p 27  
Study of Tuberculous Splenomegaly and Splenogenic Controlling of Cell Emission from Bone Marrow J Engelbreth Holm Copenhagen Denmark—p 32  
Peculiar Form of Medial Calcification in Aorta of Dog W C Corwin and R W Cragg Rochester Minn—p 47  
Xanthoma Diabeticorum Associated with Diabetes Mellitus and Acromegaly Case J A Buchanan and J C Indelicato Brooklyn—p 50  
Photometric Studies of Visual Adaptation in Relation to Mild Vitamin A Deficiency in Adults M B Corlette J B Youmans Helen Frank and Mildred G Corlette Nashville Tenn—p 54  
Posttraumatic Internal Hydrocephalus A R Moritz and W B Wartman Cleveland—p 65  
\*Assimilation of Protein by Young Children with Nephrotic Syndrome L E Farr New York—p 70  
Clinical Observations on Effects of Choline Compounds in Neurologic Disorders with Especial Reference to Meniere's Syndrome M J Cooper San Antonio Texas—p 83  
Human Autonomic Pharmacology VII Effect on Normal Cardiovascular System of Acetyl Beta Methylcholine Chloride Atropine Prostigmine Benzedrine with Especial Reference to Electrocardiogram W Dameshek J Loman and A Myerson Boston—p 88  
\*Cause of Death in Coronary Thrombosis with Especial Reference to Pulmonary Embolism E C Eppinger and J A Kennedy Boston—p 104

**Assimilation of Protein by Children with Nephrosis**—Farr observed five children, all 4 years of age, with the nephrotic syndrome, for fifty-four days on diets differing in the protein content. When the optimal level of protein intake for retention observed in the patients is compared with the optimum for normal children, the surprising fact becomes apparent that there are no marked differences between the two groups. Studies of other authors on the protein requirements of normal children have yielded results showing optimal growth and general condition with about the same protein intakes which yielded maximal nitrogen retention in the author's nephrotic children. Some of the results suggest that addition of fat beyond a certain amount decreases nitrogen retention. His

results offer no support for the thesis that in patients with albuminuria the optimal protein intake can be calculated by adding to the ordinary maintenance diet an amount of protein equal to or proportional to the loss of protein in the urine. The total failure to assimilate protein fed above 33 Gm per kilogram of body weight serves to emphasize the point that physiologically optimal intake of a given food is not necessarily the greatest amount that can be handled by the alimentary tract. Still less do the results justify forcing high protein diets, as by addition of casein or lactalbumin, to the point of gastro-intestinal rebellion. The results obtained with children do not disprove for adults the usefulness of the rule of Peters and Bulger, whereby the protein fed is 75 Gm plus the amount of protein lost in the urine, the amounts thus calculated are seldom above 1 to 1.5 Gm per kilogram of body weight and may never exceed the usual assimilating optimum of adults. The author's data do not indicate that in the nephrotic syndrome the loss of protein in the urine is accompanied by compensatory increase in ability to assimilate food protein.

**Cause of Death in Coronary Thrombosis**—To determine the incidence of pulmonary infarction as well as other causes of death, Eppinger and Kennedy review the records of 200 consecutive cases of coronary thrombosis proved by necropsy. The study shows that 32 per cent of the patients died suddenly, 53.5 per cent died of congestive heart failure and 14.5 per cent of other causes. Of the latter group, two died of mesenteric embolism and one of cerebral embolism. In addition to myocardial rupture, ventricular fibrillation and Stokes-Adams attacks, it was found that pulmonary embolism accounted for sudden death in 65 per cent of the cases. Among 107 patients dying of congestive heart failure, pulmonary embolism was the most important contributory cause of death in thirty-five (32.7 per cent). Embolism occurred in sixty-two cases (31 per cent), but in only forty-nine (24.5 per cent) did this complication affect the outcome of the disease.

### American Journal of Tropical Medicine, Baltimore

17 773 880 (Nov.) 1937

- Proposed Revision of the Memorial Conference Classification of Leprosy H. W. Wade Culion P. I.—p. 773
- Studies on Capacity of Various Brazilian Mosquitoes Representing the Genera *Psorophora*, *Aedes*, *Mansonia* and *Culex* to Transmit Yellow Fever L. Whitman and P. C. A. Antunes Bahia Brazil—p. 803
- Studies on Capacity of Mosquitoes of the Genus *Hemagogus* to Transmit Yellow Fever P. C. A. Antunes and L. Whitman Bahia Brazil—p. 825
- Recurring Clinical Activity in Infections with the McCoy Strain of *Plasmodium Vivax* M. F. Boyd and S. F. Kitchen Tallahassee Fla.—p. 833
- Duration of Intrinsic Incubation Period in *Falciparum* Malaria in Relation to Certain Factors Affecting Parasites M. F. Boyd and S. F. Kitchen Tallahassee Fla.—p. 845
- Employment of Multiply Infected *Anopheles Quadrimaculatus* to Effect Inoculation with *Plasmodium Vivax* and *Plasmodium Falciparum* M. F. Boyd, S. F. Kitchen and W. H. Kupper Tallahassee Fla.—p. 849
- Simultaneous Inoculation with *Plasmodium Vivax* and *Plasmodium Falciparum* M. F. Boyd and S. F. Kitchen Tallahassee Fla.—p. 855
- Study of *Brucella* Infection and Immunity in Humans I. F. Huddleson Myrtle Munger East Lansing Mich. S. E. Gould and Doris Paulson Eloise Mich.—p. 863

### Archives of Pathology, Chicago

25 1148 (Jan.) 1938

- Variations in Size, Weight and Histologic Structure of Thyroid Gland L. E. Nolan Minneapolis—p. 1
- Chemical Reaction Between Oleic Acid and Aqueous Solutions of Magnesium: Its Pathologic Significance P. J. Hartsuch Chicago—p. 17
- \*Experimental Embolic Glomerulonephritis Produced with Human Fat, Fatty Acids and Calcium Soaps C. S. Hagerty University Ala.—p. 24
- Experimental Tissue Lesions with Mixtures of Human Fat, Soaps and Cholesterol E. F. Hirsch Chicago—p. 35
- Chemotropic Substance Derived from Normal Tissues D. Silverman Philadelphia—p. 40
- \*Cultural Studies on Relationship of Lymphocytes to Monocytes and Fibroblasts J. W. Hall and J. Furth New York—p. 46
- Recent Contributions to Immunology of Helminthic Infections J. T. Culbert New York—p. 85

**Experimental Embolic Glomerulonephritis**—Hagerty produced lesions similar to those seen in diffuse glomerulonephritis in man in the kidneys of dogs and rabbits by injecting into the renal arteries emulsified oleic acid liquid petrolatum and human fat alone or containing calcium soaps. Two vari-

ties of glomerular lesions were produced, dependent on the chemical composition of the fat. Mild fat irritants caused proliferation of endothelial cells and minimal growth of collagenous tissue. Strong irritants produced glomerular reactions in which there was swelling of endothelial cells and marked production of collagenous substance. Moderate irritants caused proliferation of endothelial cells and production of collagen. The various types of lesions in kidneys from patients with glomerulonephritis may represent alterations in response to irritants of different strengths. Fat may be an etiologic agent in the renal changes of Bright's disease.

**Lymphocytes, Monocytes and Fibroblasts**—Hall and Furth investigated the conditions under which lymphocytes are thought to undergo transformation into monocytes and fibroblasts. The most significant of the experimental studies were made with the aid of tissue cultures, and in some of these material presumably containing lymphocytes alone, lymph of the thoracic duct, was used. The results of the experiments do not support the opinion of Bloom and other workers that lymphocytes of the thoracic duct are transformed in vitro into monocytes. Since monocytes were present in only small numbers in the cultures of the lymph of the thoracic duct, and fibroblasts were absent, it was desirable to determine whether the medium used was suitable for multiplication of monocytes and fibroblasts. From the fragments of the buffy coat of the blood, monocytes in great numbers migrated into the explant within twenty-four hours. In the splenic cultures, fibroblasts and histiocytes grew in large numbers. Monocytes appeared in the lymph cultures in variable numbers, depending on the number present before incubation. The great number of large lymphocytes in the lymph is noteworthy in this connection, for in fixed and stained preparations of tissue these cells can be distinguished from monocytes with difficulty. In the degenerating lymphocyte, the nucleus becomes homogeneous, the cytoplasm is more voluminous and the cell assumes an appearance similar to that of a blood monocyte. The percentage of monocytes in lymph varied from 0.14 to 0.6 (one tuberculous rabbit having 2.3 per cent).

### Arkansas Medical Society Journal, Fort Smith

34 157 182 (Jan.) 1938

- \*Anxiety States T. A. Waters New Orleans—p. 157
- Sphenoid Sinusitis R. Caldwell Little Rock—p. 163
- Prenatal Care I. F. Jones Fort Smith—p. 167

**Anxiety States**—Waters states that in the anxiety state one sees a biologic reaction in which the whole personality reacts to some situation which threatens the patient's security and contentment. The symptoms are usually explained by the patient on the basis of "organic" disease, with serious import. This intensifies the symptoms and creates a vicious circle. In anxiety states one has to deal not only with the attacks but also with the part reaction precipitating and predisposing causes and effects, which is the basis for the syndrome. After obtaining an account of the development of the present illness it is then necessary to gather more facts concerning the background out of which the present illness came into existence. When the patient's biography is completed, the physician is ready to give the patient an explanation and formulation of his condition. In a frank, matter of fact way he is told that his complaints have been given thorough consideration and that no "organic" condition can be held accountable for his symptoms, nevertheless they have a very definite cause and he must therefore collaborate with the physician in order to work out his problems.

### California and Western Medicine, San Francisco

48 172 (Jan.) 1938

- Microsurgery in Chronic Simple Glaucoma O. Burkan San Francisco—p. 10
- Physical Phenomena Associated with Anxiety States: Hyperventilation Syndrome W. J. Kerr, P. A. Giebe and J. W. Dalton San Francisco—p. 12
- Diabetic Surgery: Ten Year Survey I. Wills and P. A. Gray Santa Barbara—p. 16
- Medicine and National Policy M. F. Meier Chicago—p. 21
- California Venereal Disease Control Program M. H. Merrill San Francisco—p. 24



# Canadian Medical Association Journal, Montreal

38 1106 (Jan) 1938

- Salpingitis B Whitehouse Birmingham England—p 1  
Place of Radium in Treatment of Cancer A Lacassagne Paris France—p 9  
Pathologic and Immunologic Studies in Poliomyelitis M Brodie Detroit—p 13  
Preeclampsia W P Tea London Ont.—p 20  
German Measles or Rubella H B Cushing Montreal—p 24  
Head Injuries A R Elvidge Montreal—p 26  
Surgical Treatment of Facial Injuries F Risdon Toronto—p 33  
\*Solution to Mystery of Chronic Appendicitis W A Bigelow Brandon Manit.—p 36  
\*Basal Pulmonary Lesions H R Corbett Kentville N S—p 38  
The Management of Esophageal Diverticula W O Stevenson Hamilton Ont.—p 42  
Diagnosis of Some Major Vascular Accidents D M Baltzan Saskatoon Sask.—p 45  
Some Complications Following Abdominal Operations N J Maclean Winnipeg Manit.—p 50  
Value of Mapharsen in Treatment of Congenital Syphilis E A Morgan Toronto—p 53  
Disturbances of Sebaceous Glands W R Jaffrey Hamilton Ont.—p 56

**Chronic Appendicitis**—Bigelow sent a questionnaire in January 1937 only to those 167 persons on whom appendectomy had been performed elsewhere, previous to operation at his clinic to cure a chronic pain in the right side of the abdomen and in whom the diagnosis had been made of "chronic appendicitis." None of the patients experienced any relief from the appendectomy performed. All cases in which acute appendicitis was diagnosed and operation performed were excluded. The patients were operated on by the author's usual method of complete removal of all so called congenital bands and membranes from the cecum or ascending colon or hepatic flexure, or any combination of these present. Of the 147 patients who responded to this request, 136 reported complete relief from pain on the right side. This gives a result of 92 per cent cured by this operation.

**Basal Pulmonary Lesions**—Corbett deals with the common diseases occurring in adults and stresses from a roentgenologic aspect the technic employed in bringing such cases to a diagnostic conclusion. Distortion and blurring from heart action and arterial pulsations are more prone to occur at the bases of the lungs. Fluoroscopically the lung tissues near the heart tend to follow the movements of the heart itself but lag behind the more rapid movements. The greatest lung movement is near the apex of the heart, and the excursion of the lung tissue at this point appears to be half that of the heart cycle (end of systole and beginning of diastole), the speed of the lung tissue is roughly one eighth the maximal speed during the heart cycle. The intrascope or planigraph has the advantage of detecting and localizing pulmonary cavities. In the standard postero-anterior examination of the chest the cardiovascular shadow obscures the lung parenchyma occupying the inferior and medial margin of the left lung, including the retrocardiac area and the paravertebral quarter on both sides. The region can be demonstrated by films in the right and left oblique as well as the true lateral. Usually all cases are checked up fluoroscopically and if a lesion is suspected special films are taken.

# Iowa State Medical Society Journal, Des Moines

28 140 (Jan) 1938

- Hyperinsulinism and Hypoglycemia in Infants and Children A F Hartmann St Louis—p 1  
Dangers in Use of Protamine Zinc Insulin R L Jackson and J D Boyd Iowa City—p 3  
Fulminating Meningococcal Septicemia with Bilateral Adrenal Hemorrhage J S Weingart Des Moines—p 5  
Intrathoracic Goiter K L Johnston Okauchee—p 6  
Breast Tumors G Augustine Council Bluffs—p 8

**Intrathoracic Goiter**—Johnston considers intrathoracic goiter as simply thyroid tissue within the superior mediastinal cavity, which is the space left in the thorax by the nonapproximation of the two pleurae and above the pericardial sac, behind the sternum and in front of the upper thoracic vertebrae. It is almost invariably adenomatous in nature. The effects are largely disturbances of pressure caused by a growing mass within a bony cage which cannot expand and the proximity of this pressure to vital mediastinal structures. Toxic symptoms the well known chronic thyrotoxicosis syndrome, may be present but thoracic surgeons emphasize their secondary place

in the picture and many authorities stress their rarity. This is essentially a disease beyond the fourth decade of life. The respiratory signs appear first and are constantly present. They begin as an effort dyspnea, which soon becomes a marked inspiratory stridor. A hacking cough and choking spells at night, which make suffocation seem imminent, appear. Hoarseness as a symptom has been variously interpreted. Circulatory signs are next in importance. They are primarily interference with the function of the blood vessel. Pressure on the thoracic vessels causes venous stasis of the thorax, leading to heart stasis, then cardiac dilatation, and myocardial degeneration. When the overburdened heart fails, auriculoventricular block or fibrillation occurs and death follows in typical congestive heart failure or by a sudden coronary accident. Tracheal deformity is manifest by curving or bowing from the normal midline position and by diminution in tracheal diameter in some axis, or in the change in the tracheal shape, and stereoscopy is often of great aid. Dysphagia is rare. Percussion of the upper anterior thorax may show dullness, but its absence is undependable. In the differential diagnosis of the condition aortic aneurysm, thymus tumor, Hodgkin's disease, intrathoracic dermoids, esophageal diverticulum, lung tumor, Pott's disease, mediastinitis and the asthmas must be considered. The treatment is surgical.

# Kansas Medical Society Journal, Topeka

38 501 540 (Dec) 1937

- Carcinoma of the Colon Complicated by Amebiasis G B Kent K C Sawyer and C F Kemper Denver—p 501  
The Preservation of Bacteria Desiccated in a Vacuum at Room Temperature N P Sherwood and L L Coriell Lawrence—p 506  
The Management of Ureteral Calculi V L Pauley Wichita—p 509  
Diaphragmatic Hernia M Bernreiter Kansas City—p 510  
Mental Symptoms in Brain Tumor Review of Some of the Recent Literature J Pessin Topeka—p 513

# Maine Medical Journal, Portland

29 122 (Jan) 1938

- Graduate Medical Education in Maine F T Hill Waterville—p 1  
Case History E H Drake and F F Ferguson Portland—p 3  
Herpes Zoster Gangrenosus Report of Case I F Gregory Bangor—p 7

# New England Journal of Medicine, Boston

218 152 (Jan 6) 1938

- Hemolytic Streptococcus Infections with Especial Reference to Prognosis and Treatment with Sulfanilamide C S Keefer Boston—p 1  
Encephalography in Diagnosis of Subdural Hematomas Analysis of Thirty Five Cases T J C von Storch and D Munro Boston—p 6  
Rectal Exsial Sodium as a Local Anesthetic in Urologic Surgery J H Harrison and J E Dunphy Boston—p 10  
What Massachusetts Does for Its Mental Defectives N A Dayton, Boston—p 13  
Progress in Hematology in 1936 W Dameshek Boston—p 15

# West Virginia Medical Journal, Charleston

34 148 (Jan) 1938

- Function of the Dentist in Prevention and Care of Intra Oral Cancer H H Ashbury Elkins—p 1  
Magnetizable Intra Ocular Foreign Bodies I D Cole Clarksburg—p 9  
Medical Aspects of Peptic Ulcer A S Brady Jr Charleston—p 13  
Peptic Ulcer J E Cannaday Charleston—p 15  
Apparent Synergism of Apomorphine and Morphine Report of Case G R Maxwell and G A Emerson Morgantown—p 25  
\*Dermatitis Eczematosa Due to Butesin Picrate O G King Bluefield—p 28  
Streptococcal Meningitis Review of Case Treated Successfully with Sulfanilamide T G Folsom Huntington—p 33

**Dermatitis Eczematosa Due to Butesin Picrate**—Since minor household burns are frequent and sunburn has become a national prerequisite to good health King reviews the reported cases of sensitivity to butesin picrate. He cites two cases and offers the theory that the lymphatics are probably concerned both before and after the drug or toxic agent reaches the blood stream. The patch test showed one of the patients to be sensitive to trinitrophenol and the other to butesin. The patient sensitive to trinitrophenol was hospitalized for two weeks and lost a total of fifty days from work, whereas the one sensitive to butesin spent four weeks in the hospital and was not able to work until after the sixth week. Treatment consisted of withdrawal of butesin picrate rest in bed symptomatic relief, wet dressings of 5 per cent tannic acid and boric acid ointment.



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Archives of Disease in Childhood, London

12 339 406 (Dec.) 1937

- Studies in Gastro-Enteritis E D Cooper—p 339  
Studies in Anemia of Infancy and Childhood L G Parsons Evelyn M Hickmans and Ethel Finch—p 369  
Continuous Intravenous Drip in Infants and Children. W C Black.—p 381

## British Journal of Urology, London

9 327 454 (Dec.) 1937

- Three Unusual Primary Kidney Tumors F S Patch—p 339  
Medical Treatment of Urinary Infections D M Dunlop—p 359  
Carcinoma of Penis G S Foulds and B W Stevens—p 368

## British Medical Journal, London

2 1207 1260 (Dec 18) 1937

- Radiologic Aspects of Bone Tumors R E Roberts—p 1207  
Progress of Diphtheria Prevention Survey and Some Results J G Forbes—p 1209  
Sex Linked Microphthalmia Sometimes Associated with Mental Deficiency J A F Roberts—p 1213  
Modern Control of Scarlet Fever W R F Collis—p 1216  
\*Vitamin E in Treatment of Habitual Abortion D Currie—p 1218  
\*Pigeons as Possible Tetanus Carriers A W Russell—p 1220

**Vitamin E in Treatment of Habitual Abortion**—Currie discusses the results in thirty-seven women who aborted more than once and whom henceforth he treated with wheat germ oil. Collectively these women had had 130 pregnancies and gave birth to only sixteen viable children. Under treatment there were thirty-seven living children. Two of them aborted, there were two sets of twins, and four children died in the hospital from prematurity. The appearance of albuminuria of pregnancy to a severe degree was a new problem that arose during treatment. Five patients showed gross signs of toxemia, in one it was necessary to induce labor by puncture of the membranes and in two cesarean section was carried out. In the majority of cases treatment was not instituted until after the twelfth week of pregnancy and yet the results show sufficient success for some credit to be ascribed to the use of the vitamin, even after complete placentation. Some observers consider that the vitamin is of value only in the early months. Naturally, some of these women might have gone to term unaided, as did two who failed to return until they were in labor. Wheat germ oil has also been given with success in cases of threatened abortion. Fifteen of these have been so treated and fourteen taken successfully to term. Along with the administration of the vitamin the other recognized methods of treatment were used.

**Pigeons as Possible Tetanus Carriers**—Russell cites a fatal case of tetanus in a child of 18 months. The incubation period was twenty-four hours at the most and death ensued in about forty-four hours from the onset of the illness. The typical clinical signs were exhibited and large doses of anti-tetanus serum intramuscularly and intrathecally were given at the earliest opportunity. The subsequent investigation seems to implicate a pigeon (or pigeons) as a 'carrier' of tetanus. No animals were available for inoculation tests with the tetanus bacilli obtained on culture from the pigeon's droppings, but the evidence otherwise would suggest the following chain of events: 1 The pigeon became infested with tetanus bacilli, probably by pecking horse manure, and became a 'carrier,' passing the bacilli or spores in its droppings, although showing no sign of illness itself. 2 The droppings infected the ground below the pigeon loft. 3 The child playing on the ground became infected through the skin which was broken and scratched as the result of active scabies. 4 The child developed clinical tetanus and died after a brief illness.

## East African Medical Journal, Nairobi

14 281 310 (Dec.) 1937

- Traumatic Rupture of Gallbladder Report of Case M A W Roberts—p 283  
Esophageal Hiatus Hernia Case J F Q Conolly and W G S Henkirk—p 287  
Achochroia in a Kenya Native F J Wright—p 289  
Birth per Rectum Case P G Prescott—p 290

## Indian Medical Gazette, Calcutta

72 713 776 (Dec.) 1937

- Gnathostomiasis in Human Beings P A Maplestone and N V Bhaduri—p 713  
Organization of Blood Transfusion Service in District Hospital P C Dutta—p 715  
Electrocardiographic Changes in Beri-beri T K Raman—p 717  
\*Use of Tea in Treatment of Burns M V P Peiris—p 718  
Use of Cod Liver Oil in Infected Wounds B Chatterjee—p 721  
Interatrial Septal Defect with Mitral Insufficiency of Congenital Origin P Kutumbiah and P Ramachandra Rao—p 722  
Color Chart for Determination of Hydrogen Ion Concentration C L Pasricha and S Ghosh—p 725  
Experimental Investigation into Duration of Tolerance to Reinfection in Monkey Malaria B M Das Gupta—p 726  
Renal Efficiency in Glaucomatous Patients J N Jaswal—p 728  
Clearance of Pistia Stratiotes as Control Measure for Filaria Malayi Infection W C Sweet and V Madhavan Pillai—p 730  
Effect of Reduced Pressure Combined with Increased Temperature on Viability of Bedbugs and of Their Eggs E Somasekhar—p 734  
Sanitary Improvements Through Village Health Leagues K Prasada.—p 737

**Use of Tea in Treatment of Burns**—Peiris advises the use of tea in the treatment of burns. A pot of tea is prepared by infusing six teaspoonfuls of black tea in six cupfuls of boiling water for ten minutes. Four layers of clean handkerchiefs or sheeting are soaked in the hot tea and the warm compresses are applied directly to the burned area. A light bandage is applied over it. The bandage is soaked with tea when it gets dry during the first twenty-four hours. The dressing is left on for from twelve to fourteen days. The constitutional treatment is carried out in the usual way. Anti-tetanic serum is given on the first day. If at any time there is sepsis as evidenced by a rising temperature, rapid pulse, coated tongue and anorexia, the dressings are reapplied after the wound has been cleansed thoroughly under an anesthetic. In the place of compresses, spraying with tea may be carried out every hour for from twelve to twenty-four hours as in the case of tannic acid. An electric cradle will help the applications to dry. Cutaneous grafting is necessary for the large ulcers of deep burns. During the last six months the author has treated twelve cases of burns. Six were extensive third degree burns. The early cases were treated with compresses of moist tea leaves remaining in the ward teapot. The burnt areas healed as rapidly with tea compresses as with tannic acid compresses. There were no deaths.

## Lancet, London

2 1469 1522 (Dec 25) 1937

- Some Principles of Child Discipline R Miller—p 1469  
Blood Chemistry in Intestinal Obstruction Changes in Response to Treatment M A Falconer and A Lyall—p 1472  
\*Observations on Complement Fixation Test in Psittacosis S P Bedson—p 1477  
Acute Silicosis in Lead Miners R W Thomas with note on histology by S L Cummins—p 1481  
Standardization of Extracts of Suprarenal Cortex G Torok and L Neufeld—p 1485

**Complement Fixation Test in Psittacosis**—Bedson has prepared a psittacosis antigen from a crude virulent mouse spleen suspension by centrifugating out the virus, resuspending it in phosphate buffer and heating the suspension for thirty minutes at 212 F. This heated antigen has been found superior to the crude virus suspension for carrying out complement fixation tests with the serums from patients with human psittacosis. The advantages of the heated antigen are that it makes the test more delicate that it is not dangerous to handle and that it is stable.

## Bull. of Health Org., League of Nations, Geneva

6 299 504 (June) 1937

- Report on Popular Nutrition in Chile C Dragoni and E Burrel—p 299  
The Milk Problem Critical Study of Its Nutritional Hygienic Economic and Social Aspects H C Bendixen G J Blink J C Drummond A M Leroy and G S Wilson—p 371

## Chinese Medical Journal, Peiping

52 623 790 (Nov.) 1937

- Traumatic Stricture of the Male Urethra F H Wang and G Y Char—p 623  
Obstetric Criteria in North China I Analysis of Arterial Findings G King and C M Yuch—p 639  
Schistosomiasis in Japan C F Chu—p 651

**Presse Médicale, Paris**

46 73 96 (Jan 15) 1938

Ocular Pain and Photophobia A. Magitot—p 73

\*Remarks on Gangrenes of Exanthematous Typhus M Costantini Liaras and Bourgeon—p 75

Tuberculosis Localized in Rhinopharynx and Compressing Soft Palate. Z Cheridjian and T Sciclounoff—p 76

**Gangrene in Exanthematous Typhus**—Of the surgical complications of exanthematous typhus, Costantini and his associates wish to discuss only gangrene, especially the gangrene of the skin and of the extremities. The moist type is progressive and it is difficult to decide to what extent amputation is necessary. Dry gangrene is characterized by a rapid arrest of the process of extension. This arrest is characterized by a furrow, which separates the dead from the living tissue. The natural process traces with precision the way which should be followed by the bistoury and the saw. This makes possible economical interventions in contradistinction to the great sacrifices that become necessary in the hasty interventions required in moist gangrene. Posttyphic gangrene is of the dry type, involving either an extensive portion of the skin or a portion of the extremities. Generally the gangrene involves a lower limb, but an illustration is shown in which the posttyphic gangrene involves an arm. When the skin alone is involved, transformations occur which result in a black dried plaque with clear-cut borders. This plaque is cast off and the resulting wound is rapidly covered with epidermis. The scar is soft and the surrounding skin appears well perfused. It may happen that the gangrenous cutaneous zones do not involve the fat of the skin. Then the blackish patch can be detached without much effort or becomes detached spontaneously and the tissues underneath already show considerable epidermization. The authors further discuss posttyphic gangrene of the toes, of which two illustrations are shown. Discussing the pathogenesis of the gangrene in exanthematous typhus, they direct attention to the nodules of Franckel, which are specific for typhus. These nodules are found in the central nervous system, in the myocardium and under the epicardium, but their site of predilection is around the vessels. If they cause obliteration of the vessels, gangrene will result. The authors discuss the surgical treatment of the gangrene of exanthematous typhus. They stress two points. 1 There should be no haste, it is advisable to wait the time that is necessary for the development of the spontaneous separation between the living and dead tissues. 2 The knife or the saw should follow the furrow of demarcation.

**Schweizerische medizinische Wochenschrift, Basel**

GS 37 56 (Jan 8) 1938

Progress in Insulin Therapy H C Hagedorn—p 37

\*Question of Primary Tuberculosis of Tonsils E Schlittler—p 42

Physiologic Observations in Treatment of Paralysis of Recurrent Nerve K Kistler—p 44

Influence of Radium and of Radon on Normal Cell and Cancer Cell T Gordonoff and F Ludwig—p 45

Breast Feeding in Switzerland. Imboden Kaiser—p 47

**"Primary" Tuberculosis of Tonsils**—Schlittler says that four years ago he reported about ninety-eight cases of tuberculous lymphomas of the neck in which tonsillectomy was done. Microscopic examination of the tonsils revealed a tonsillar tuberculosis in forty-eight cases. He assumed that the process in the tonsils was a primary infection with subsequent secondary infection of the adjoining lymph nodes, for the following reasons: (1) the fact that the majority of the patients (63 per cent) were less than 12 years old, (2) the fact that in 73 per cent of the cases only one tonsil was involved, (3) the localization of the lymphomas, (4) the behavior of the lymphomas after tonsillectomy (disappearance in 70 per cent of the cases) and (5) the fact that the absence of clinical signs of a pulmonary tuberculosis seemed to contraindicate a sputogenic tuberculosis, while a hematogenic secondary tuberculosis seemed to be contraindicated by the absence of other forms of tuberculosis. During the last four years the author observed forty-one additional cases of chronic or subacute lymphadenitis of the neck in which tonsillectomy was done. The examination of the tonsils in this series revealed tuberculosis in all cases. The author says that observations on this second series of tonsils have modified his opinion about the pathogenesis of tonsillar tuberculosis. As regards the age factor, this second series differed from the first

in that the size of the age groups of patients above and below 12 years was exactly the opposite. Moreover, the unilateral involvement of the tonsils was not as frequent as had been the case in the first series, and thus it seems no longer justified to assume that a hematogenic infection is less probable than a primary infection of the tonsils. On the basis of these and other considerations the author suggests that perhaps the greatest majority of the eighty-nine cases of histologically demonstrated tonsillar tuberculosis were not primary tuberculous processes but new infections or secondary infections of hematogenic origin. However, he thinks that further investigations will be necessary to determine the exact percentage incidence of definitely primary, postprimary (new infection) or secondary hematogenic forms of tonsillar tuberculosis.

**Folia Medica, Naples**

23 1151 1206 (Nov 15) 1937

\*Action of Extracts of Spleen on Hematopoietic Organs and Endocrine Glands R del Zoppo—p 1153

Volume of Liver During Experimental Necrosis of Right or Left Ventricle A Rubino—p 1166

Postantiserum Local Tetanus and Tetanus Prevention M Mauro—p 1178

**Action of Extract of Spleen on Hematopoietic Organs**—Del Zoppo made histologic studies on the hematopoietic organs and endocrine glands of young normal rabbits of both sexes which had had a hypodermic injection of 8 or 12 Gm of splenic extract for each kilogram of body weight. The extract induced slight hyperplasia of the thyroids and of the anterior lobe of the hypophysis, moderate hyperplasia of the bone marrow with predominant proliferation of granulocytes, intense hyperplasia of the lymph nodes and of the lymphatic tissue, especially of the spleen, and degeneration of the parenchyma of the liver and of the pancreas and of the acinous tissues of the pancreas. The kidneys, adrenals and genital glands were not modified. The author's results are in conflict with those reported by Torrioli and Pusic as to the inhibiting or stimulating action of extracts on the bone marrow. Probably the conflicting results show that the effect of the extract depends on the dose and route of administration. Small doses administered hypodermically, such as were used by the author, stimulate moderately the bone marrow and intensely the lymphatic structures. Large doses of the splenic extract, administered intravenously (Torrioli and Pusic), cause hyperplasia of the reticulo endothelium and secondary aplasia of the bone marrow. The extract has also a toxic effect on the pancreas and the liver.

**Prensa Medica Argentina, Buenos Aires**

25 156 (Jan 5) 1938 Partial Index

Value of Contrasting Methods in Roentgenography of Joints R A Marotta and F M Bustos—p 1

Chemotherapy in Tuberculosis in Children A A Raimondi and A Sangiovanni—p 7

\*Congenital Valvular Obstruction of Posterior Urethra in Infant Case D Brachetto-Brian E C Brewer and Sara de Lazara—p 12

Multiple Subcutaneous Nodules in Cancer of the Lung E S Mazzei, J M Remolar and R Latenda—p 37

Roentgenology of Perinephritis N B Turco—p 43

Osteosynthesis Use of Small Nails E Finochietto—p 46

**Obstruction of Posterior Urethra**—Brachetto Brian and his collaborators report a case of general dilatation of the urinary tract from congenital valvular obstruction in an infant, aged 5½ months. The mother had pulmonary tuberculosis but the son was soon taken away from her. The tuberculin reaction and the roentgen examination of the lung gave negative results for tuberculosis. He showed progressive nutritional disturbances, great distention of the abdomen without gastro-intestinal symptoms and painful, difficult micturition. Later on anemia, vomiting diarrhea, nervousness and terminal bronchopneumonia developed. At necropsy a membranous valve was found at the posterior urethra, which caused permanent retention of urine with consequent dilatation of the urinary tract. The bladder had no neck. The prognosis depends on early treatment. The most frequent early symptoms are infection and latent uremia. Roentgen examination shows the fundus of the bladder in the form of a funnel. Nutritional disorders of unknown etiology, pain and distention of the abdomen and painful micturition with a small stream in children are suggestive of valvular obstruction.

tion of the neck of the bladder. Removal of the valves results in restoration of normal micturition. Satisfactory results are reported in the literature from the use of the "cautery punch" in the treatment of the condition in young children.

### Deutsches Archiv für klinische Medizin, Berlin

181 229 348 (Dec. 11) 1937 Partial Index

- \*Investigations on Development of Extrasystoles by Interference of Two Rhythms P. Eckey —p. 229
- Clinical Observations on Several Abnormal Postinfectious Vascular Reactions and Their Relations to Allergy H. Weselmann —p. 257
- \*Studies on Basal Metabolism During Artificial Fever E. Schafer-Fingerle —p. 268
- Studies to Clarify Sudden Death During Swimming Contest E. J. Klaus —p. 275
- Clinical Syndrome: Narcolepsy with Obesity and Polyglobulism in Its Relation to Cushing's Disease Annie Spitz —p. 286
- Observations on Secretion of Fasting Stomach During and After Treatment with Jejunal Catheter F. Maret —p. 305
- Premature Lymphocytic Phase of Cure in Diphtheria and Scarlet Fever Following Specific Serotherapy H. A. Heinsen and H. Biedenkopf —p. 318

**Extrasystoles Produced by Interference of Two Rhythms**—Eckey says that the opinion that extrasystoles are the manifestation of an impairment of the cardiac muscle failed to correspond to the clinical aspects in many cases. For this reason other possibilities were considered, and there are two theories which have especial importance for the development of extrasystoles. The first one is the circle theory of de Boer according to which the extrasystole is causally connected with the preceding normal beat. The second theory is that of Kaufmann and Rothberger, who regard extrasystole as an interference manifestation of two rhythms. Eckey points out that by comparing the various theories and by considering that one theory may explain one characteristic of an extrasystole and another theory another, it must be concluded that extrasystoles are not a uniform disorder. It is still doubtful whether the existing theories will explain all cases of extrasystole. He reports three cases which throw light on the interference theory. He demonstrated that the extrasystoles, which apparently were scattered at random into the electrocardiographic curves, were the result of the interference of a special ventricular stimulation center with the sinus rhythm. It could be demonstrated that an increase in the tonus of the vagus has an inhibiting effect on the ventricular center, whereas a decrease in this tonus has a stimulating effect. This possibility had formerly been denied. The author demonstrated also the incorrectness of the opinion that the cessation of the extrasystole is a result of changed interference conditions following alteration of the sinus frequency by work or the stimulation of the vagus. He could prove that work as well as pharmacologic stimulation of the vagus, by inhibiting the special stimulation center, leads to a reduction in or to the complete disappearance of the extrasystole.

**Basal Metabolism During Artificial Fever**—Schafer-Fingerle says that investigations on the metabolic processes during fever have demonstrated that the increase in temperature is nearly always accompanied by a more or less pronounced increase in oxidation. However, observations during recent years have shown that infections may produce the same metabolic disturbances independent of the development of fever. This fact had long been known about afebrile tuberculosis, but the same phenomenon can be observed in some disorders caused by colds, in sepsis lenta and so on. Moreover in malaria therapy it was observed that an increase in oxidation is already noticeable before the fever has developed. In connection with the therapeutic use of fever the question arises whether the therapeutic action is exerted by the fever as such or by the increase in the metabolic processes connected with it. In order to throw light on this problem the author decided to study the metabolic and fever reactions produced by the various substances that are used in the production of therapeutic fever such as bacterial proteins of apathogenic bacteria and autovaccine. He found that following the administration of these substances an increase in oxidation takes place independently of the fever reaction. In cases in which it was possible to produce an increase in the metabolism independently of the

fever reaction, the general effect was the same as after a temperature reaction. To be sure, in the course of repeated injections it is no longer possible to separate the increase in the metabolic rate from the fever reaction, and it is consequently difficult to decide whether the therapeutic action is entirely determined by the increase in metabolism.

### Bibliotek for Læger, Copenhagen

129 401 433 (Dec.) 1937

- \*Endemic Infection with Paratyphoid B Bacillus Fermenting Dextrotartaric Acid at Hospital for Insane K. Boylen, C. Clemmensen and Margrete Lomholt —p. 401

**Infection with Paratyphoid B Bacillus Fermenting Dextrotartaric Acid**—The picture in the pronounced cases in this endemic at St. Hans Hospital from November 1934 to May 1937, described by Boylen and his associates, was that of an acute gastro-enteritis, but the cases were mild. There was acute gastro-enteritis in twenty-eight cases, afebrile diarrhea in thirty-six and "silent" infection in seventy-three. In four cases the fatal outcome is attributed to the infection and in five the infection is regarded as a possible contributing cause of death. In feces tests made extensively at the hospital for many years in cases of intestinal disorders the dextrotartaric acid positive paratyphoid B bacillus was never before isolated. In the thirteen scattered cases of infection with the bacillus in question discussed by Martin Kristensen in the *Bibliotek for Læger*, November 1937, page 390, four sharply defined types of the bacillus were found. In the hospital endemic the bacilli were all of one of these types. In the authors' opinion the endemic was most likely introduced by a chronic bacillus carrier, a convalescent carrier or a patient with acute infection and continued by new acute cases, convalescent carriers, patients with "silent" infection and chronic bacillus carriers, spreading in spite of precautionary measures which had been effective in the fight against "institutional diarrhea." The bacteria appeared to be of low virulence which could, however, under certain conditions change character. The cases are tabulated in detail.

### Hospitalstidende, Copenhagen

80 1245 1280 (Nov. 30) 1937

- Reactivity of Thrombocyte System S. Heindl —p. 1245
- \*Polycythemia Vera: Hypothesis Concerning Its Gastrogenic Pathogenesis Together with Case in Which Treatment Consisted of Gastric Lavage and Diet E. Mogensen —p. 1271

**Polycythemia Vera**—Mogensen says that, while the concept of polycythemia vera as a "plus variant of the gastric function as against the minus variant pernicious anemia" may not seem to be strongly founded, the promising results reported after treatment with gastric lavage and diet or with diet alone call for further attempts with such treatment. In his patient, with a red cell count of 10,000,000, daily treatment for five months with gastric lavage and diet according to Morris was without effect. Later treatment for four weeks with a diet low in animal protein according to Herzog was also ineffective. He interprets the negative results in this case as an indication that the disorder termed polycythemia vera may include different pathogenic identities.

80 1281 1320 (Dec. 7) 1937

- \*Investigation on Liver Function in Certain Skin Diseases with Remarks on Etiology and Treatment V. Genner and T. H. With —p. 1281

**Liver Function in Skin Diseases**—Genner and With applied Bauer's galactose test, Roma's lipase test, determination of the icterus index (Meulengracht) and series determination of the urobilinogen (Ehrlich) and bile acids (Hay) in the urine of 365 patients, of whom 104 had lupus vulgaris, seventy-four psoriasis, 102 eczema, fifty-nine pruritus and prurigo and twenty-six prurigo Besnier. They assert that their results do not support the assumption of an endogenic disturbance in metabolism as the cause or the result of these skin diseases. Numerous factors indicate that prurigo as well as eczema depends chiefly on the effect of external noxae in connection with individual peculiarities of the skin which make it especially susceptible. The basis for the frequent more or less rigorous diet therapy in these cutaneous disorders is therefore considered too meager to justify its imposition.

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## ALCOHOLIC INTOXICATION

ITS DIAGNOSIS AND MEDICOLEGAL IMPLICATIONS

SYDNEY SELESNICK, M D

BOSTON

The increasing popularity of high speed automobiles during the past decade has raised the problem of alcoholism above the level of morality and made it an issue of life and death. In 1936 motor vehicle deaths totaled 37,800. There were also 1,300,000 nonfatal traffic injuries, about 100,000 of them representing disabilities of a permanent character. In addition there were nearly 6,000,000 "property damage only" accidents. The total economic loss due to motor vehicle accidents for 1936 is conservatively estimated as \$1,640,000,000. All summaries now available on fatal accidents show, on the average, that 7 per cent of the drivers and 11 per cent of the pedestrians "had been drinking" or were intoxicated.<sup>1</sup> In spite of the importance of establishing responsibility in accidents involving individuals who have been imbibing alcoholic beverages, the physician and the law still quibble about what constitutes alcoholic intoxication and what criteria are acceptable for establishing such a diagnosis.

Can it be established by scientific means (a) that an individual has imbibed alcohol and (b) whether or not that individual has become sufficiently intoxicated to impair the rational and full exercise of his mental and physical faculties?

There are so many simple methods of determining alcohol content in body fluid<sup>2</sup> that this aspect of the problem can no longer be considered impracticable. The body fluid which will give the most accurate estimation of the degree of alcoholism at the time the sample is obtained has been the subject of controversy.

Gettler and Freireich,<sup>3</sup> working on spinal fluid for the determination of alcoholic intoxication during life, elaborated the spinal fluid-brain ratio. In their opinion all persons having 0.265 per cent or more alcohol in the spinal fluid (or a spinal fluid-brain ratio below 1.4) are intoxicated. Alcohol enters the spinal fluid by

diffusion from the blood<sup>4</sup> and leaves it by diffusion back into the blood once the blood alcohol level falls below that in the spinal fluid.<sup>5</sup> The alcoholic content of the spinal fluid in the lumbar sac rises more slowly than that in the blood, attaining its maximum two to three hours later.<sup>6</sup> The alcohol content in the cistern fluid, on the other hand, rises more promptly and closely approximates that of the blood. Cistern fluid would seem, therefore, the ideal fluid for the estimation of alcohol content of the brain in living persons. Since cistern puncture is at present a major medical procedure, it is not practical for the purpose of routine spinal fluid analyses for the determination of alcoholic intoxication.

The alcohol content of expired air is said to follow closely that of the blood. However, false values will be derived if a person has had a drink of alcoholic beverage within fifteen minutes before the sample of expired air is obtained, or if he regurgitates from the stomach.<sup>7</sup> Smith and Stewart<sup>8</sup> state that if expiration is complete a larger amount of alveolar air with a relatively higher alcohol content is obtained than if breathing is shallow.

Abels<sup>9</sup> reports that the alcohol content of saliva agrees with the blood alcohol within 3 per cent. But it has been found that the rate of increase of salivary alcohol in some instances exceeds the rate of increase in the blood and, furthermore, saliva contains a variable amount of oxidizable material equivalent in some cases to about 12 mg of alcohol.<sup>10</sup>

The correlation between urinary alcohol concentration and the clinical manifestations of alcoholism is humorously portrayed in the accompanying illustration. Urinary alcohol may represent the degree of alcohol saturation at some preceding time rather than at the moment the sample is taken if the urine has been held in the bladder for some time before being voided.<sup>11</sup> If the urine is collected during the period of alcohol absorption, while the blood alcohol is rising, the urinary alcohol will be lower than the blood alcohol. Also if

4 Mehrrens H G and Newman H W Alcohol Injected Intravenously Its Penetration into the Cerebrospinal Fluid in Man Arch Neurol & Psychiat 30 1092 1099 (Nov) 1933

5 Fleming Robert and Stoltz Elmer Experimental Studies in Alcoholism Alcoholic Content of the Blood and Cerebrospinal Fluid Following Oral Administration in Chronic Alcoholism and the Psychoses, Arch Neurol & Psychiat 33 492 506 (March) 1935

6 Newman H W and Mehrrens H G Reliability of Spinal Fluid Analyses in Diagnoses of Drunkenness Proc Soc Exper Biol & Med 30 725 727 (March) 1933 Mehrrens and Newman

7 Bogan Emil Drunkenness Quantitative Study of Acute Alcoholic Intoxication Am J M Sc 176 153 167 (Aug) 1928

8 Smith Sydney and Stewart C P Diagnosis of Drunkenness from Excretion of Alcohol Brit M J 1 87 90 (Jan 16) 1932

9 Abels J C Determination of Ethyl Alcohol in Saliva Proc Soc Exper Biol & Med 34 504 505 (May) 1936

10 Friedemann T E Excretion of Ethyl Alcohol in Saliva and a Rapid Method for Its Determination J Biol Chem 105 200 204 (May) 1934

11 Hall W W Drunkenness Naval Medicolegal Aspects of Its Diagnosis U S Nav M Bull 34 149 163 (April) 1936

This is one of a series of papers from the Advisory Committee on the study of alcoholism at the Boston City Hospital sponsored by the Works Progress Administration

From the Fifth Medical Service (John A Foley M D Physician in Chief) Boston City Hospital and the Department of Medicine Boston University School of Medicine

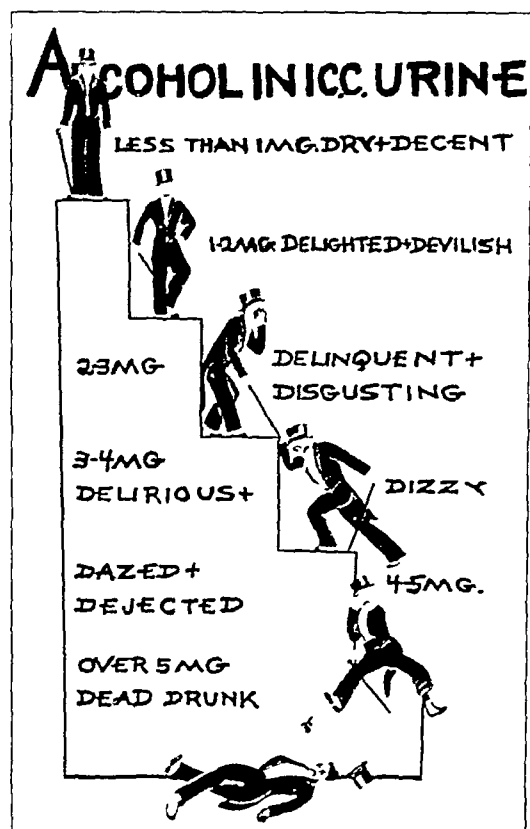
1 Traffic Accident Facts Public Safety National Safety Council Inc. 12 10 13 (June) 1937

2 Newman H W Determination of Ethyl Alcohol in Body Fluids J Pharmacol & Exper Therap 56 278 283 (March) 1936 Abels J C Simple Method for Determination of Ethyl Alcohol in Blood Proc Soc Exper Biol & Med 34 346 351 (April) 1936 Friedemann T E and Kinas Rosalind Determination of Ethyl Alcohol J Biol Chem 115 47 61 (Aug) 1936

3 Gettler A O and Freireich A W Determination of Alcoholic Intoxication During Life by Spinal Fluid Analyses J Biol Chem 92 199 209 (July) 1931

the urine is collected during the period of decline of blood alcohol the urinary alcohol will be higher than the blood alcohol<sup>8</sup>

The blood alcohol concentration always represents the degree of alcohol saturation at the moment the blood sample is obtained. Though venous blood never actually reaches the peak of alcohol saturation that is attained in arterial blood, a rise or fall in the level of venous blood alcohol reflects a similar though greater rise or fall in the arterial level.<sup>12</sup> A venous blood alcohol determination done on a sample of blood taken within ninety minutes after ingestion of alcohol would be lower than the arterial blood alcohol concentration. After ninety minutes the two approximate each other,



Humorous portrayal of correlation between clinical manifestations of alcohol and urinary alcoholic levels. (From a sketch drawn by Mrs. Merrill Moore and reproduced with her permission.)

for thereafter equilibration of alcohol between arterial and venous blood and body tissues has taken place.<sup>12</sup> Blood appears to be a medium for analysis offering the best opportunity for giving the alcoholic suspect as fair an appraisal of his degree of alcoholism as is possible in that (a) the amount of "nonalcoholic" oxidizable material in blood is negligibly small, (b) the blood alcohol concentration always reflects the degree of alcohol saturation at the moment the blood sample is obtained, (c) unlike other body fluids blood is always available and (d) its extraction does not necessitate the active participation of the subject.

It is becoming more and more obvious that drunkenness is no longer to be considered synonymous with alcoholic intoxication. Though alcoholic intoxication is

an inseparable component of drunkenness when the latter exists, it is to be considered, rather, in a biologic sense. Heise<sup>13</sup> states that an excess of ethyl alcohol in the body fluids or tissues over the normal body alcohol,<sup>14</sup> even in the absence of gross manifestations of alcoholism, is to be considered alcoholic intoxication. It is known that small amounts of alcohol are capable of causing considerable disturbance with those activities requiring rapid integration and accurate coordination—without producing any gross signs that might lead even a competent observer to suspect drunkenness. As automobile driving, for example, is a common activity demanding at all times a high degree of rapid integration and accurate coordination, it becomes obvious how necessary and important it is to improve the criteria ordinarily employed in the determination of alcoholic intoxication.

Naville<sup>15</sup> found that slight intoxication in human beings starts when the blood alcohol content ranges from 0.1 to 0.2 per cent (from 100 to 200 mg per hundred cubic centimeters of blood). Carlson,<sup>16</sup> working with 150 subjects, male and female, habitues and abstainers, concluded that none of his subjects showed sufficient intoxication to cause that degree of impairment which would cause him to be a menace to the public until the blood alcohol concentration exceeded 0.1 per cent. Turner<sup>17</sup> concluded that in general intoxication is not noticeable in the human being until the blood alcohol concentration is greater than 0.2 per cent. Using the method of blood alcohol determination described by Turner<sup>18</sup> based on the Naville modification of the Nicloux method, results similar to Turner's were obtained (shown in the accompanying table).<sup>19</sup>

From a group of fifty unselected cases admitted to the alcoholic ward of the Fifth Medical Service of the Boston City Hospital, the following general conclusions were drawn. Except for an odor of alcohol on the breath, clinical manifestations of intoxication do not appear until the blood alcohol exceeds 0.2 per cent, when the content is from 0.2 to 0.3 per cent, evidence of intoxication was definite and characterized chiefly by a change in affect, the patients being loquacious, crafty, witty, silly or belligerent, with some disturbance in locomotion, when it was from 0.3 to 0.4 per cent, walking was very unsteady or impossible, speech was thick, and drowsiness was the rule, when it was from 0.4 to 0.5 per cent there was no voluntary activity whatever, deep stupor supervening from which the patient could be roused by painful stimuli, when it was above 0.5 per cent practically all patients were in alcoholic coma. There was considerable overlapping in all the groups.

#### SUBCLINICAL INTOXICATION IN THE BIOLOGIC SENSE

What is most important from the medicolegal aspect is elucidation of subclinical intoxication or alcoholic intoxication in the biologic sense without any gross manifestations of drunkenness. Are there suffi-

12 Haggard H. W. and Greenberg L. A. Studies in the Absorption, Distribution and Elimination of Ethyl Alcohol. Excretion of Alcohol in Urine and Expired Air and the Distribution of Alcohol Between Air and Water, Blood and Urine. *J. Pharmacol. & Exper. Therap.* 52: 150-167 (Oct.) 1934.

13 Heise H. A. Alcohol and Automobile Accidents. *J. A. M. A.* 103: 739-741 (Sept. 8) 1934.

14 Harger R. N. and Goss A. I. So Called Normal Alcohol of Body. *Am. J. Hyg.* 112: 374-382 (June) 1935.

15 Naville F. and Rossetti E. Difficultés et erreurs dans le diagnostic de la cause des morts dites naturelles. *Rev. med. de la Suisse Rom.* 18: 742-749 (Sept. 10) 1928.

16 Carl on A. J. Criteria of Acute Alcohol Intoxication. *Science* 80: 546 (Dec. 14) 1934.

17 Turner R. G. Blood Alcohol and Its Relation to Intoxication in Man. *Proc. Soc. Exper. Biol. & Med.* 22: 1548-1552 (June) 1935.

18 Turner R. G. Blood Alcohol and Its Relation to Intoxication. *J. Pharmacol. & Exper. Therap.* 44: 305-324 (March) 1932.

19 Data collected by Sydney Selesnick and Leon J. Rubin during the course of a study on alcoholism at the Boston City Hospital.

cient scientific data available to prove beyond any reasonable doubt that such an intoxicated person driving an automobile is a potential public menace?

In what might be considered a crucial experiment Heise<sup>13</sup> gave to selected persons 150 cc of whisky (equivalent approximately to two or three ordinary whiskies) and then put them into automobiles to observe their reactions while driving. He noted a definite variation from the normal in acts involving the avoidance of obstacles placed on the road and in backing the car. Reaction time between a given signal and the application of brakes was increased. All the subjects showed lack of appreciation of changes in judgment and motor control. Yet, without exception, every one was able to pass creditably the ordinary tests used to determine drunkenness and to perform the routine acts involved in driving. Heise says that it is not the drunk who constitutes the menace in driving but the drinking driver. He believes that loss of efficiency and judgment occurs even with blood alcohol concentrations as low as 0.02 per cent (20 mg per hundred cubic centimeters of blood).

Bahnsen and Vedel-Petersen,<sup>20</sup> in an extensive and painstaking group of studies on a large number of subjects, including both habitues and abstainers, tested for speed reaction, speed of muscular contraction, muscle coordination and ability of concentration before and after the ingestion of given amounts of alcohol. Even the progress of practice that follows several repetitions of the same experiment was checked and controlled. The results of the study show that not only does alcohol retard all the observed reactions and tend to lower the final grade of their performance but it also nullifies the progress of practice. It is important to note that, though not one of their large group of subjects was described as clinically intoxicated in any sense, their performances were inferior. Analyzing the results of Bahnsen and Vedel-Petersen on the basis of the blood alcohol concentrations, Schmidt<sup>21</sup> shows that the maximum effects of the alcohol take place just after the maximal blood alcohol concentration is attained, which occurs from fifteen to ninety minutes after ingestion of the alcoholic beverage.

Cattell<sup>22</sup> feels that it is fairly well established by his experiments that a dose of 20 Gm of alcohol (equivalent to slightly more than 2 ounces [60 cc] of whisky) lowers the intelligence quotient and diminishes the power of recalling past experiences. In a comprehensive study on a group of six men including habitues and abstainers, Hollingworth<sup>23</sup> concludes that in all the mental and motor tests used by him the effect of alcohol is to reduce the score. In all cases the effect varied directly with the size of the dose. It has been demonstrated<sup>24</sup> that one glass of beer increased the incidence of error in a simple experiment (precision in making a number of dots) by 21 per cent, peripheral vision (which catches moving objects) may be affected up to 11 per cent. After an amount of alcohol equivalent to 2¼ ounces (67.5 cc) of whisky errors in type-writing increased 40 per cent for the next two hours and after twice this quantity of alcohol by 70 per cent, alcohol in small or moderate amounts has been shown to impair coordination of leg movements, the speed

with which the gaze is directed to fresh objects is measurably impaired by the drinking of alcohol.<sup>25</sup> Newman<sup>26</sup> gave alcohol intravenously to nine patients. The average maximum attained by the alcohol in the blood stream was 112 mg per hundred cubic centimeters (0.112 per cent). A third of them evidenced a feeling of well being which verged on euphoria. All showed an increased loquacity. Many had slight slurring of speech. Although drowsiness was present in most cases to some degree, there was no evidence of loss of contact with reality.

Schwarz,<sup>27</sup> in a discussion of the quantitative determination of the alcohol content of the blood and its significance in connection with automobile accidents, evaluates the results of alcohol analyses in more than 1,000 cases. He concludes that his results dispel any doubt as to the practical value of the quantitative alcohol analysis. Concentrations between 0.1 and 0.15 per cent were accompanied by signs of alcoholic intoxication in 93.7 per cent of cases. The latter concentrations were found most frequently in instances of traffic accidents. Excessive speed and neglect of safety rules, as the result of the excitation caused by the alcohol, were the usual causes of such accidents. With the

TABLE 1—Correlation Between Blood Alcohol Levels and Clinical Manifestations of Alcoholism\*

	Blood Alcohol in Gm /100 Cc									
	Under 0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0	Over 1.0
Clinical Manifestations of Alcoholism Cases	5	5	0	0	0	0	0	0	0	0
Odor of alcohol, no other signs	5	5	0	0	0	0	0	0	0	0
Odor of alcohol with change in affect	12	0	4	4	4	4	4	4	4	4
Thick speech, unable to walk, drowsy	15	0	1	5	6	6	6	6	6	6
Stupor, rousable by painful stimuli	13	0	0	0	0	0	0	0	0	0
Coma	5	0	0	0	0	0	0	0	0	0

\* The method of blood alcohol determination described by Turner based on the Naville modification of the Nicolson method was used.

content of blood alcohol above 0.20 per cent, Schwarz thinks it may be asserted that the individual in question is incapable of coping even with comparatively simple traffic problems.

The fact that some individuals are able to imbibe large quantities of alcohol without showing any apparent signs of intoxication has been a major argument against the acceptance of alcohol levels of body fluid as criteria for degrees of intoxication. Various reasons have been proposed for this difference in tolerance to alcohol, including decreased absorption from the gastrointestinal tract, increased elimination by the lungs and kidneys, increased tissue resistance to high concentrations of alcohol and increased oxidation of the alcohol by the tissues. In a recent review of the literature Newman<sup>28</sup> points out that the nature of alcohol tolerance is still a controversial subject. The older literature leaned toward increased oxidation of alcohol to explain it. Recent studies seem to prove this theory untenable.

#### COMMENT

At the request of the Minister of Transport the British Medical Association recently appointed a special committee to investigate and report on the relation between road accidents and alcoholism. The summary

20 Bahnsen, Paul and Vedel-Petersen, K. Alcohol Studies. Experiments on Drivers of Motor Vehicles. *J. Indust. Hyg.* 16: 304-322 (Sept.) 1934.

21 Schmidt, Max (Copenhagen). Alcohol Studies. Concentration of Alcohol in Blood. *J. Indust. Hyg.* 16: 35-365 (Nov.) 1934.

22 Cattell, R. B. Effects of Alcohol and Caffeine on Intelligent and Affective Performance. *Brit. J. Med. Psychol.* 10: 20-33 (May) 1930.

23 Hollingworth, H. I. Influence of Alcohol. *J. Abnorm. Psychol.* 15: 204-217 (Oct-Dec) 1922.

24 Efficiency on the Road. The Effect of Alcohol. *Brit. M. J.* 1: 1280 (June 2, 1935).

25 The Relation of Alcohol to Road Accidents. Report by British Medical Association Committee. *Brit. M. J.* 1: 57-59 (July 27) 1935.

26 Newman, H. W. Alcohol Injected Intravenously. Some Psychological and Psychopathological Effects in Man. *Am. J. Psychiat.* 91: 1343-1352 (May) 1933.

27 Schwarz, Fritz. Some Experiences in Quantitative Determination of Alcohol Content of Blood. *Schweiz. med. Wchnschr.* 67: 54 (Jan 16) 1937. *abstr. J. A. M. A.* 108: 767 (Feb. 27) 1937.

28 Newman, H. W. Recent Studies on Alcohol. *Am. J. Med. Sc.* 102: 565 (Dec.) 1936.

of the committee<sup>29</sup> in part is as follows: Alcohol in small or moderate amounts has been shown to diminish attention and control, to affect reasoning adversely, to affect adversely the power to make movements dependent on rapid and accurate coordination, and the ability of the eyes to follow clearly an object brought nearer and nearer. After taking alcohol the automobile driver may believe himself to be driving better but in fact his body works less efficiently. This happens even if alcohol is taken in moderate quantities some hours before driving and especially on an empty stomach.

In this country the American Medical Association, recognizing that "the street is a battlefield and that thousands of our citizens are killed and disabled by reckless, incompetent and physically disqualified individuals," has appointed a committee to study problems on motor vehicle accidents. The committee states in part in its preliminary report<sup>29</sup> "Since it is impossible to diagnose drunkenness adequately—drunkenness from symptoms alone—it is important that the chemical observation of the blood, urine, saliva or breath for alcohol be used to confirm obvious intoxication."

The drinking driver subclinically intoxicated is at the present time a distressing medicolegal problem. Given a clever attorney to protect his interests he all too frequently escapes conviction for driving under the influence of alcohol. Even competent members of the medical profession could not prove to the satisfaction of the court that such an individual was unfit to drive an automobile on clinical grounds alone. It has been adequately shown, however, that there are scientific means which deal out impartially data capable of including or excluding beyond any reasonable doubt the question of alcoholic intoxication. These means ought to be widely employed.

Repeated experiences have shown that, in accidents in which a person has been traumatized, drowsiness, stupor or coma cannot be safely attributed to alcoholism simply because there is an odor of alcohol on the breath. In such cases it is vital to exclude the possibility of cerebral concussion, brain laceration, fractured skull, extradural hemorrhage and subdural hematoma. In such cases blood alcohol determinations, especially if they show minimal degrees of alcohol in the body fluids, would cry out for the necessity of searching for some other factor as the cause of the drowsiness, stupor or coma.

Everard Dickson, British magistrate, asks "Are physicians positive that they can make an examination which will enable them to say beyond all reasonable doubt in all cases that the accused person is or is not to a serious extent affected by drink and that the real explanation of the symptoms exhibited is not to be found in some other condition?"<sup>30</sup> It can be determined by blood alcohol estimations whether or not an individual has an abnormal amount of alcohol in his body fluids and tissues. The adverse effect of abnormal amounts of alcohol in the body has been demonstrated. It has also been shown that the adverse effect of alcohol increases with greater concentrations of alcohol in the tissues. It remains simply to state that any individual who is under the influence of alcohol, however slight it may be, is unfit to assume the responsibilities associated with driving an automobile. The greater the degree of intoxication the greater the gravity of the offense, for the law does not recognize drunkenness as a defense,

for a man intends the consequences of his own acts. The driving public must be impressed with the seriousness of even minor degrees of intoxication, the courts with the responsibility of the drinking driver. The Committee on the Driver of the National Safety Council has for the present accepted 0.150 per cent blood alcohol as the level above which alcoholic intoxication is definite.<sup>29</sup> This offers too wide a margin of laxity for the drinking driver. Experimental studies on habitues and abstainers show almost consistently that there occur appreciable disturbances in psychomotor activity at far lower levels of blood alcohol. It is likely that this level will be lowered in the future.

An objection may be raised relative to the privilege of the suspected alcoholic individual to refuse to submit to the extraction of blood. It is true that nobody by law can be made to testify against himself. Finger prints might similarly be categorized in that they too may be used as testimony against an individual, yet they are taken freely with the tacit approval of the law. With regard to blood extraction it can be pointed out that the same objections were raised regarding blood group tests in cases of disputed parentage. However, laws were enacted in New York State in 1935 authorizing the courts to order blood grouping tests in cases of disputed parentage and in civil suits when relevant to issues, and to receive the results in evidence. Shortly thereafter similar laws were enacted in Wisconsin and there are now bills pending before the legislatures of Montana, California and New Jersey.<sup>31</sup> Similar laws can be enacted with regard to extraction of blood for the estimation of the content of alcohol in the blood. Any infringement on civil rights exposes the offending individual to the curtailment of certain of his liberties by law. If the law will recognize the importance of blood alcohol determinations in accidents having medicolegal aspects, the offending individual will cease to have the liberty of refusing to allow the extraction of blood. The evidence to be obtained is just as likely to be favorable to the suspect as not.

#### SUMMARY

It is important to have definite criteria as a basis for the diagnosis of alcoholic intoxication in accidents involving individuals who have imbibed alcoholic beverages. The chemical determination of body fluid alcohol offers a scientific means of establishing whether or not an individual has imbibed alcohol and of estimating the degree of alcoholic intoxication. Blood as a medium for analysis is preferable to spinal fluid, urine, saliva and expired air, because it contains a negligibly small amount of nonalcoholic oxidizable material, its alcoholic content represents the degree of alcohol saturation at the moment the blood sample is obtained, it is always available, and its extraction does not necessitate the active participation of the subject. There are sufficient scientific data to prove that subclinical intoxication—or alcoholic intoxication in the biologic sense without any gross manifestations of drunkenness—can produce sufficient interference with psychomotor activity and neuromuscular coordination to render such an affected individual a potential public menace. Blood alcohol determinations can detect these degrees of alcoholic intoxication which ordinarily escape the detection of competent physicians. Criteria, therefore, must be established which include body fluid alcohol determinations as part of the diagnostic armamentarium.

<sup>29</sup> Preliminary Report of the Committee to Study Problems of Motor Vehicle Accident. J. A. M. A. 108: 213 (June 19) 1937.

<sup>30</sup> Dickson, Everard. "Medicolegal Aspects of Drunkenness." Med. Leg. & Criminol. Rev. 3: 274-281 (Oct.) 1935.

<sup>31</sup> Report of the Committee on Medicolegal Blood Grouping Tests. J. A. M. A. 108: 2138 (June 19) 1937.



## A RAPID CHEMICAL TEST FOR INTOXICATION EMPLOYING BREATH

A NEW REAGENT FOR ALCOHOL AND A PROCEDURE FOR ESTIMATING THE CONCENTRATION OF ALCOHOL IN THE BODY FROM THE RATIO OF ALCOHOL TO CARBON DIOXIDE IN THE BREATH

R N HARGER, PH D

E B LAMB, MD

AND

H R HULPIEU, PH D

INDIANAPOLIS

Chemical tests for intoxication have been used very little in the United States in spite of the fact that certain of them were available more than twenty years ago and even though procedures employing blood and urine have been official for some time in certain European countries, notably Sweden, Switzerland and Germany. The adoption of such tests in this country appears to have been hindered by both legal and practical difficulties. First there is the question of whether our states can legally compel a person to give a specimen of blood or urine.<sup>1</sup> On the practical side there is frequently a long delay before a specimen of blood or urine can be obtained, and during this interval the subject's condition may materially change. With blood one must wait for the arrival of a physician or a properly trained technician. As to urine, we agree with Southgate and Carter<sup>2</sup> that intoxicated subjects frequently will not or cannot produce a specimen when asked to do so. Finally, none of the existing tests can be performed at the scene of the accident or in most local police stations, which means that the subject may be detained for hours or even days until the analyst's report is available. The procedure described in this paper was developed with the object of eliminating or minimizing these difficulties.

## BODY MATERIALS SUITABLE FOR PREDICTING THE CONCENTRATION OF ALCOHOL IN THE BRAIN

The absorption of alcohol from the gastro-intestinal tract is rapid. Recent experiments in our laboratory<sup>3</sup> with fasting dogs which received 3 Gm of alcohol per kilogram by stomach tube and were killed at various intervals showed an average absorption of 52.3 per cent in fifteen minutes and 99 per cent in three hours. This dose corresponds to a little more than a pint of whisky for a man weighing 150 pounds (68 Kg). With smaller doses the speed of absorption was greater. Food in the alimentary tract somewhat delays absorption.<sup>4</sup>

After absorption alcohol is rapidly transported to all parts of the body, where it is stored in proportion to the water content of each body material.<sup>5</sup> The entire body thus reaches a condition of storage equilibrium as to alcohol, and as the total alcohol content decreases—mostly by oxidation—the concentration ratios of alcohol in the various body materials remain the same. After equilibrium occurs it is thus possible to estimate

the distribution of alcohol all over the body from the concentration in any part. The brain, blood and liver reach equilibrium almost at once. The correlation between alcohol level in the blood and in the brain is shown in figure 1. These data show that with widely varying doses of alcohol and with test periods ranging all the way from fifteen minutes to twelve hours after the administration of alcohol, the concentration of alcohol in the brain could always be closely predicted from that in the blood. We found a similar parallelism between the alcohol level in the liver and in the brain. With muscle there was a lag for one or two hours, after which the concentration in the muscle too could be used to predict that in the brain. Even the alimentary tract and its contents were found to attain equilibrium within from two to three hours and could then be used for estimating the concentration of alcohol in the brain.

Simultaneous analyses for alcohol in the blood and in the lumbar spinal fluid made in forty-six consecutive cases at the Indianapolis City Hospital showed a close parallelism between the two as to alcohol

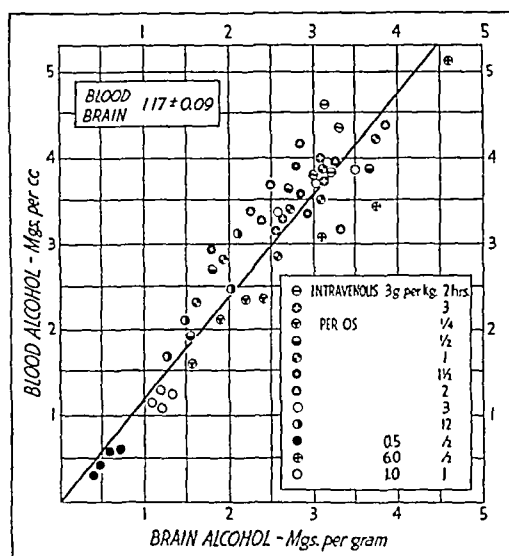


Fig 1—Correlation between the concentration of alcohol in the brain and in the blood in fifty three dogs (from Harger Hulpieu and Lamb<sup>3</sup>)

(fig 2) Carlson and his associates<sup>6</sup> have shown a good correlation between the level of alcohol in the blood and in the urine (fig 3). There is also a fixed relationship between the level in the saliva and in the blood, as pointed out by Linde.<sup>7</sup> Yant and Schrenk<sup>7</sup> have reported almost identical results regarding the distribution of methyl alcohol in various body tissues and fluids. Finally, breath may be employed for predicting the concentration of alcohol in the body. In 1910 Cushman<sup>8</sup> pointed out that the distribution between the alveolar air and the blood of such volatile substances as acetone, ether and alcohol obeys Henry's law, which means that the concentration of alcohol in the blood may be predicted from the concentration in the alveolar

From the Department of Biochemistry and Pharmacology, Indiana University School of Medicine and the Indianapolis City Hospital.

<sup>1</sup> Inbau F E. Self Incrimination. What Can an Accused Person Be Compelled to Do? *J Crim Law & Criminol* 28: 261 (July-Aug) 1937.

<sup>2</sup> Southgate H W and Carter G. Excretion of Alcohol in Urine. *Brit M J* 1: 463 (March 15) 1926.

<sup>3</sup> Harger R N, Hulpieu H R and Lamb E B. The Speed with Which Various Parts of the Body Reach Equilibrium in the Storage of Ethyl Alcohol. *J Biol Chem* 120: 689 (Sept) 1937.

<sup>4</sup> Mellanby Edward. *Ct Brit Med Research Council Spec Rep Ser* No 31 1919.

<sup>5</sup> Carlson A J, Kleiman N, Muchlberger C W, McLean F C, Gullickson H and Carl R B. Studies on the Possible Intoxication, Action of 3.2 per Cent Beer. Chicago University of Chicago Press 1934.

<sup>6</sup> Linde Paul. Der Uebergang des Aethylalkohols in den Larynxspeichel beim Menschen. *Arch f exper Path u Pharmacol* 107: 285 1932.

<sup>7</sup> Yant W P and Schrenk H H. Distribution of Methanol in Dogs After Inhalation and Administration by Stomach Tube and Subcutaneous. *J Indus Hyg & Toxicol* 19: 337 (Sept) 1937.

<sup>8</sup> Cushman A R. On the Exhalation of Drugs by the Lungs. *J Physiol* 40: 17 (April 26) 1910.

air Emil Bogen in 1927<sup>9</sup> first proposed use of analysis of the breath as a test for intoxication His pioneer work in this field included a comparison of the concentration of alcohol in the breath with that in the urine in fifty cases A constant relationship between the amount of alcohol in the blood and in the alveolar air has been further confirmed by the work of Liljestrand

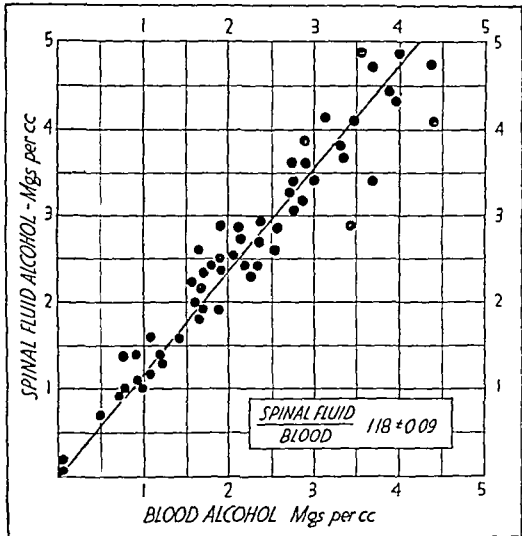


Fig 2—Correlation between the concentration of alcohol in the blood and in the spinal fluid in forty six human subjects (from Harger Hulpien and Lamb)

and Linde<sup>10</sup> and that of Haggard and Greenberg<sup>11</sup> It is thus evident that the concentration in the brain can be predicted from that in the blood, urine, spinal fluid, saliva and breath The use of breath has appealed to us because breath may be obtained with less difficulty than any of the other substances mentioned

THE RATIO OF ALCOHOL TO CARBON DIOXIDE IN THE BREATH AS A MEASURE OF THE ALCOHOL IN THE BLOOD

The carbon dioxide tension of pulmonary blood and alveolar air are practically identical, and in 1905 Fitzgerald and Haldane<sup>12</sup> reported that the alveolar air of normal subjects always contains close to 55 per cent of carbon dioxide by volume Subsequent work by Higgins,<sup>13</sup> Turner<sup>14</sup> and Main<sup>15</sup> indicated some fluctuation due to posture, fasting and other factors, but this is not very great and most of it may be eliminated by placing the subject in a sitting or a reclining position Since the tendency of carbon dioxide to escape from the blood and other body fluids is constant, it would seem that the quantity of alcohol which accompanies the carbon dioxide should vary directly with the concentration of alcohol in the blood The carbon dioxide content of a sample of breath may be

used as a measure of the fraction of alveolar air in such a sample However, it is likely that some of the carbon dioxide in breath represents diffusion from bronchioles and bronchi, but alcohol probably diffuses also from these surfaces in much the same ratio as it does in the alveoli In 1931 one of us<sup>16</sup> reported a satisfactory prediction of the concentration of alcohol in the blood from the ratio of alcohol to carbon dioxide in the breath As to the distribution of alcohol between alveolar air and blood, Liljestrand and Linde,<sup>10</sup> using human subjects, found that 2,000 cc of alveolar air contains the same quantity of alcohol as 1 cc of blood Haggard and Greenberg<sup>11</sup> reported that for dogs this ratio is 1 1,145 Bogen<sup>9</sup> stated that in the case of human subjects 2 liters of expired air contains slightly more alcohol than 1 cc of urine Our results with human subjects agree well with those of Liljestrand and Linde and we have adopted the ratio of 1 2,000 for alveolar air and blood If alveolar air contains 55 per cent of carbon dioxide, the weight of carbon dioxide in 2 liters of such air at body temperature will be close to 190 mg The weight of alcohol in 1 cc of blood should therefore equal the quantity of alcohol in the breath which accompanies 190 mg of carbon dioxide

Use of the ratio of alcohol to carbon dioxide should eliminate errors due to fluctuations in the proportion of alveolar air in the sample of breath or, rather, fluctuations in the extent to which a given sample of breath has approached equilibrium relative to the alcohol content of the blood Judging from its carbon dioxide content, we found that the proportion of alveolar air in 500 cc of breath may vary from about 40 per cent to 100 per cent, depending on the extent to which the lungs were emptied and the length of time the air was held in the lungs In addition, the use of the ratio of alcohol to carbon dioxide permits the test to be done by means of a pump which sucks the breath through the apparatus This is particularly advantageous with subjects who will not or cannot blow into a breath

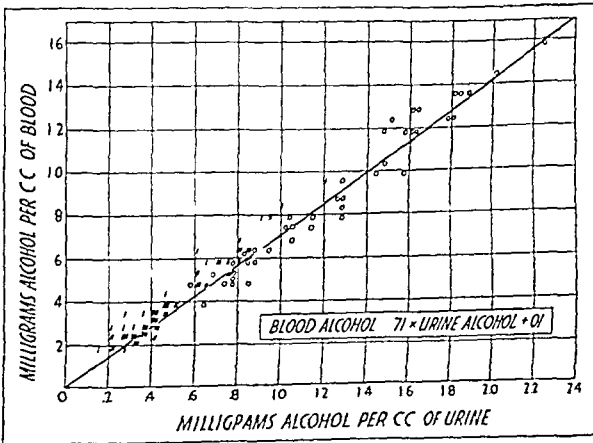


Fig 3—Correlation between the concentration of alcohol in the urine and in the blood (after Carlson and his associates)

container In this case breath is mixed with some outside air, but, since air contains no alcohol and only 003 per cent of carbon dioxide, the ratio of alcohol to carbon dioxide in the breath may still be used for predicting the concentration of alcohol in the body

REAGENT FOR ALCOHOL

As a result of rather extensive experiments, we have developed a reagent for alcohol the use of which

9 Bogen Emil Drunkennes A Quantitative Study of Acute Alcoholic Intoxication Am J M Sc 176 153 (Aug) 1928 and J A M A 89 1508 (Oct 29) 1927  
10 Liljestrand G and Linde P Ueber die Ausscheidung des Alkohols mit der Expirationsluft Skandinav Arch f Physiol 60 273 1930  
11 Haggard H W and Greenberg I A Studies in the Absorption, Distribution and Elimination of Ethyl Alcohol II The Excretion of Alcohol in Urine and Expired Air and the Distribution of Alcohol Between Air and Water Blood and Urine J Pharmacol & Exper Therap 52 130 (Oct.) 1934  
12 Fitzgerald M P and Haldane J S The Normal Alveolar Carbonic Acid Pressure in Man J Physiol 52 46 (July 13) 1905  
13 Higgins H L The Influence of Food Posture, and Other Factors on the Alveolar Carbon Dioxide Tension in Man Am J Physiol 21 114 (April 1) 1914  
14 Turner A H The Circulatory Minute Volumes of Healthy Young Women in Reclining Sitting and Standing Positions Am J Physiol 80 691 (May) 1927  
15 Main R J Variations in Alveolar Carbon Dioxide in Man During Hunger Am J Physiol 119 7 (May) 1937

involves a minimum of laboratory procedures. This reagent consists of a weak solution of potassium permanganate in the presence of approximately 55 per cent sulfuric acid by weight. When air or breath is passed through this solution any alcohol present will be absorbed and the absorbed alcohol will react rapidly and quantitatively with the permanganate. This reaction will take place at ordinary temperatures and does not require the application of heat. The change in color is a decisive one, which is marked by the disappearance of the initial purple and the formation of a very faint yellowish brown. In the high concentration of the sulfuric acid employed the reaction of the permanganate is different from that in the usual permanganate titration, in which the strength of sulfuric acid is rarely above 5 per cent. In the classic permanganate titration the manganese is reduced from a valence of seven to a valence of two. In our procedure the manganese is not reduced to a valence of two, and the faint yellowish brown solution which results is capable of further oxidation when properly diluted and heated with such substances as oxalic acid. Our reagent is not affected by acetone, which is of course of considerable importance in testing subjects suffering from ketosis. Experiments conducted with acetone alone and with solutions of alcohol containing ten times as much acetone as alcohol showed that the acetone in no way affected the behavior of the reagent. Other alcohols and ether will also reduce permanganate under the condition employed, but these substances would hardly be present in the body of an automobile driver, or, if they were present, they would be included in the substances which are banned by the driving laws of most states. The decisive change in color of the reagent may have a marked psychic effect on the subject being tested and has frequently enabled us to secure truthful statements from alcoholic subjects who at first denied drinking. The behavior of the reagent is easily demonstrated in court. The breath odors resulting from the consumption of onions, garlic, sen-sen and cloves do not affect the reagent, and tests conducted on more than 1,000 normal and hospitalized subjects failed to reveal the presence of any substance in the breath of these nonalcoholic people that was capable of reducing the permanganate reagent.

#### REAGENTS AND APPARATUS

Solution I is approximately sixteen normal sulfuric acid. It is prepared by slowly pouring three volumes of chemically pure concentrated sulfuric acid into four volumes of distilled water. When cool, the reagent is ready for use. It should be stored in a clean glass-stoppered bottle. Under no circumstances should it be allowed to come in contact with organic materials, such as rubber.<sup>17</sup>

Solution II is twentieth normal potassium permanganate solution, which is prepared by dissolving 1.58 Gm of chemically pure potassium permanganate in enough water to make one liter. One should use a good grade of distilled water and glassware which has been cleaned first with soap and then with concentrated sulfuric acid containing some dissolved chromic acid and then washed well with distilled water. If stored in a dark place the solution will keep well for at least six months. The permanganate solution may be standardized against chemically pure sodium oxalate according to the directions given in works on quantitative analy-

sis. However, we have found that solutions prepared according to the directions given assay very close to the desired strength.

A convenient form of apparatus is shown in figure 4.<sup>18</sup> The all glass reaction tube (B) carries an inlet tube extending to the bottom and ending in a perforated bulb. A funnel-shaped opening is provided at the top for the introduction of the solutions and is closed by means of a glass stopper. An etched line indicates a volume of 10 cc. A glass stopcock at the bottom permits drainage of used solutions. The upper end of the inlet tube is connected to a piece of small rubber tubing about 8 inches long (A).

In order to illuminate the lower end of tube B, the instrument board to which it is attached is provided

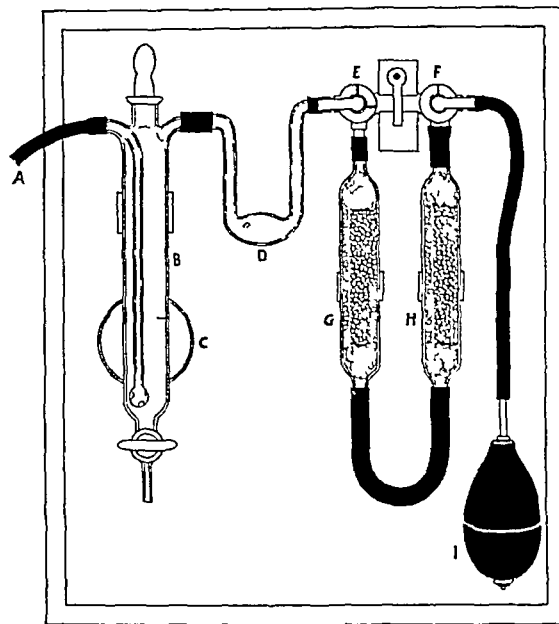


Fig. 4—Apparatus for the simultaneous determination of alcohol and of carbon dioxide in the breath.

with a window of frosted glass (C), and a flashlight bulb with battery is placed behind this window. The outlet tube from B is connected to a glass trap (D) in order to prevent droplets of fluid from being carried over into the remaining parts of the apparatus. Trap D connects with a three way valve (E), which permits the gas to pass either to the dehydrating tube (G) or directly across to a second three way valve (F). The water-removing tube (G) is filled with Dehydrite. A piece of heavy-walled rubber tubing connects the lower end of tube G with the lower end of tube H. Tube H is filled with Ascarite for the absorption of carbon dioxide. The outlet from valve F is connected by means of rubber tubing to a rubber bulb (I), which is fitted with metal check valves so that it can be used as a suction pump. The three way metal valves (E and F) are arranged so as to leave tubes G and H out of the circuit or to send the gas stream successively through them.

When not in use, the Ascarite tube (H) is stored in a larger glass tube, which is closed by means of a paraffined cork and which contains a quantity of a

17 When 10 cc of this acid is mixed with 1 cc of solution II the resulting purple fluid should undergo practically no change in color for at least one hour.

18 This apparatus mounted in a small carrying case may be obtained from the Medical Specialties Company of Indianapolis which company has been licensed by the Indiana University Foundation under patents held by the foundation.

mixture of Ascarite and Dehydrite in order to keep its interior free from moisture and carbon dioxide. Under these conditions of storage the sealed-in Ascarite tubes (*H*) will retain their weight indefinitely. When tube *H* is not in position the open end of the rubber tube at the bottom of tube *G* should be closed by means of a glass or metal plug in order to prevent the entrance of moisture into tube *G*. In addition to the apparatus shown in figure 4 there should be provided a number of balloons, a glass adapter for connecting the inflated balloons to a short piece of rubber tubing, a screw clamp for closing the rubber tube, a short glass nipple for connecting with tube *A* and three circular brass rings for roughly measuring the volume of breath contained in the balloon. These brass rings have diameters of 156 mm, 124 mm and 98.5 mm, respectively, and correspond to spheres with volumes of 2,000 cc, 1,000 cc and 500 cc. When the device is being used as a pump to draw the breath stream directly through the apparatus, the inlet tube *A* is connected to a short length of rubber tubing to which

by one or two strokes of the bulb pump. If the subject will cooperate, have him collect slightly more than 2 liters of breath in one of the balloons. Connect the balloon to a glass adapter and the other end of the adapter to a short piece of rubber tubing which is closed by a screw clamp. Release air from the balloon until it fits the large ring (2 liters). Without delay connect the rubber tube on the glass adapter to the inlet tube *A* by means of a small glass nipple. Open the pinch clamp and allow the breath to pass fairly rapidly through the apparatus but not fast enough to cause the liquid in tube *B* to foam over into trap *C*. If 2 liters of breath will not decolorize the solution in tube *B* the subject's blood contains less than 0.35 mg of alcohol per cubic centimeter, if any, and he may be discharged with the report that he has not been drinking, at least to an appreciable extent.

If the purple color of the fluid is removed by less than 2 liters of breath, the quantity of breath used for the test is roughly measured by comparing the diameter of the balloon containing the remaining breath with the two smaller brass rings. If more than 1,000 cc of breath has been used, the subject's blood contains less than 0.7 mg of alcohol per cubic centimeter and he is probably not under the influence of alcohol. If the purple color is removed by less than 1,000 cc of breath, one should perform the quantitative test described hereafter. The end point in the reaction is marked by the disappearance of the last trace of purple, which leaves a faint yellowish brown fluid.

If the subject will not or cannot cooperate, the short tube with some fine hairs attached is connected to tube *A* and its open end held about 1 inch from the subject's nose or mouth. The breath is then drawn through the apparatus by means of the pump. The action of the pump should be synchronized with the subject's respiration, and the intake stroke should coincide with an expiration. The fine hairs on the inlet tube will indicate when this tube is held in the breath stream. If fifty strokes of the pump are not sufficient to decolorize the reagent, the subject has probably not been drinking to any appreciable extent.

**Quantitative Test**—This is performed exactly as the preliminary test except that tube *H* (previously weighed) is connected in position, as shown in figure 1, and valves *E* and *F* are turned so as to include tubes *G* and *H* in the path of the gas. Either the balloon or the pump may be used to collect the breath. When the test is finished, which is indicated when the last trace of purple has just disappeared from the fluid in tube *B*, tube *H* is at once replaced in its container and the container closed. Subsequently tube *H* is sent to a laboratory for weighing. When the balloon is used, the volume of breath passed through the apparatus may be accurately measured by disconnecting the rubber bulb and connecting the outlet tube to a gas buret filled with water.

#### CALCULATIONS

We have found that under the conditions employed 1 cc of twentieth normal potassium permanganate solution is just decolorized by 0.175 mg of ethyl alcohol. The weight of carbon dioxide absorbed by tube *H* tells how much alveolar air contained 0.175 mg of alcohol. It is then a simple problem in proportion to calculate the quantity of alcohol which accompanied 190 mg of carbon dioxide, that is, the weight of alcohol in 2 liters of alveolar air and therefore the weight of alcohol of 1 cc of the subject's blood. Let *x* equal milligrams

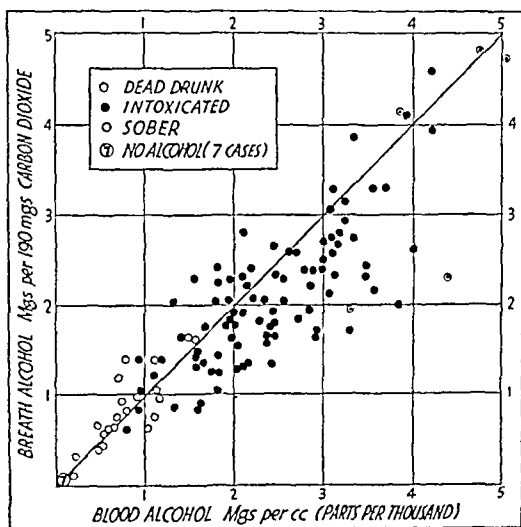


Fig. 5—Correlation of the concentration of alcohol in the blood and in the breath in 121 human subjects

are attached a few pieces of fine hair to show when this tube is held in the outgoing breath stream.

In addition to the apparatus described we suggest a bottle fitted with a rubber stopper with two holes, one carrying a glass inlet tube extending to the bottom of the bottle and the second a glass ell which ends just below the rubber stopper. When a weak solution of alcohol (about 0.5 per cent) is placed in the bottle and air is drawn through the solution it will serve as an "artificial drunk." This will permit the operator to familiarize himself with the end point of the reaction and also to demonstrate the reaction in court. A second bottle fitted up in the same way may be used for making qualitative tests for alcohol in the urine, since the urine of the alcoholic subject will serve as the fluid in the "artificial drunk."

#### PROCEDURE FOR TESTING SUBJECTS

**Preliminary Test**—In this step tube *H* is not used and valves *E* and *F* are turned to shunt the gas past tube *G* and directly out by way of the rubber tube and bulb *I*. Place in the reaction tube (*B*) about 10 cc of solution I followed by exactly 1 cc of solution II, replace the stopper and mix the contents of tube *B*

of alcohol in 2 liters of alveolar air and  $w$  the increase in weight of tube  $H$  in milligrams. Then,

$$\frac{x}{190} = \frac{0.175}{w} \quad \text{Solving, } x = \frac{33.25}{w}$$

Thus, to calculate the milligrams of alcohol in 2 liters of alveolar air or in 1 cc of the subject's blood, one simply divides 33.25 by the weight of carbon dioxide

TABLE 1—Comparison of the Concentration of Alcohol in the Blood and in the Breath as Determined from the Ratio of Alcohol to Carbon Dioxide and from Simple Volume

Subject Number	Alcohol in the Blood Mg per Cc	Alcohol in the Breath		
		Pump Mg per 190 Mg of CO	Balloon Mg per 190 Mg of CO	Balloon Mg per 4 Liters of Expired Air
1	1.46	1.08	1.36	No analysis
2	2.09	1.75	1.95	No analysis
3	2.40	1.52	1.69	No analysis
4	0.78	0.81	0.65	0.83
5	2.25	2.05	1.79	2.69
6	1.94	2.08	1.92	1.89
7	3.25	3.19	2.16	3.33
8	3.00	2.72	2.91	3.18
9	1.18	0.97	0.95	1.27
10	1.07	1.00	1.20	1.67
11	1.59	1.47	1.61	2.06
12	1.99	1.65	2.02	1.89
13	1.13	1.52	1.04	1.40
14	2.82	1.98	2.02	2.06
15	2.54	2.30	2.34	2.18
16	1.78	No analysis	2.02	1.70
17	3.00	2.51	No analysis	1.70
18	3.48	2.41	No analysis	3.34
19	1.19	No analysis	1.40	1.70
20	1.29	No analysis	1.87	1.70
21	2.93	2.41	2.24	2.33
22	1.58	No analysis	1.72	1.40
23	2.80	2.54	1.71	2.18

contained in the sample of breath which served just to decolorize the purple fluid

This figure may be checked by calculating the weight of alcohol in 4 liters of the sample of breath, since we have confirmed the observation of Bogen<sup>9</sup> that the breath as collected usually contains about 50 per cent of alveolar air. It will require 700 cc of a breath containing 1 mg of alcohol in 4 liters to remove the color from 1 cc of the permanganate solution. Then, 700—cc of breath used = mg of alcohol in 4 liters of expired air or in 1 cc of blood

#### RESULTS OF THE BREATH METHOD AS COMPARED WITH BLOOD ANALYSIS

In order to determine how closely the concentration of alcohol in the blood can be predicted from the ratio of alcohol to carbon dioxide in the breath, as computed by our method, tests were conducted on 121 persons admitted to the Indianapolis City Hospital. Most of these subjects had been involved in accidents and represented various degrees of alcoholism. The sample of breath was taken from about one half of the subjects by means of the pump and from the remainder by means of rubber balloons. We obtained specimens of blood also from all these subjects, drawn within five minutes of the time the breath was analyzed. The blood was analyzed for alcohol by a micromethod recently published by one of us.<sup>19</sup> The intern who operated the breath apparatus and drew the specimen of blood also recorded the subject's symptoms relative to intoxication, the symptoms were recorded before the final report of the analyses of the breath and the blood was received. The results obtained in this study are shown graphically in figure 5. The data show some

scattering but the average correlation is good, and in practically all of the cases the figures obtained for the breath and for the blood gave essentially the same information regarding intoxication. With part of the subjects we used both balloon and pump, and in some cases in which the balloon was used we measured the specimen of breath passed through the apparatus by collecting it over water in a gas buret. These results are given in table 1. The data indicate that the pump and the balloon gave almost identical results and that satisfactory figures were obtained by simply measuring the volume of breath used.

#### INTERPRETATION OF RESULTS OF CHEMICAL ANALYSES

It is a well established fact that the degree of intoxication may be predicted fairly closely from the level of alcohol in the body. In a recent review of this subject, Emil Bogen<sup>20</sup> stated "The accumulated records of literally thousands of instances where the signs and symptoms of alcoholic intoxication have been correlated with the concentration of alcohol in the blood and tissues have conclusively shown that they go hand in hand." In addition to twenty-three references cited by Bogen, we might mention the work of Remund,<sup>21</sup> Jungmichel,<sup>22</sup> Schwarz<sup>23</sup> and Hoffmann,<sup>24</sup> all of whom reached the same conclusion. In table 2 we have collected the statistics from extensive studies by Widmark,<sup>25</sup> Schwarz<sup>23</sup> and Bogen,<sup>9</sup> as well as some unpublished results from our laboratory, which compare the chemical results with independent clinical observations. Both Widmark and Schwarz have emphasized that the criterion of "under the influence" probably varied considerably among the large number of examining physicians, and also that the use of exact laboratory

TABLE 2—Correlation of Intoxication with the Concentration of Alcohol in the Body at Various Levels (Percentage of Subjects Clinically 'Under the Influence of Alcohol')

Alcohol Concentration (Parts per Thousand)*	Widmark Blood (562)†	Schwarz Blood (905)	Harger Blood and Breath (140)	Bogen Urine (250)	Bogen Breath (100)
0-0.5	None	2	None	None†	1.5†
0.5-1.0	23	38	46	56†	50†
1.0-1.5	49	93	50		
1.5-2.0	80	97	92	66†	85†
2.0-2.5	95	99	100		
2.5-3.0	100	100	100	88*	92†
3.0-4.0	100	100	100		
4.0-5.0	100	100	100	97*	100
4.5-5.0	100	100	100		
Above 5.0	100	100	100	100	100

\* One part per thousand equals 1 mg per gram or 0.1 per cent

† Number of subjects given in parentheses

Definitely drunk. Figures for "under the influence of alcohol" should be considerably higher. (See explanation in text.)

procedures would frequently have revealed impairment of driving ability in borderline cases in which persons were adjudged sober. In a private com-

20 Bogen Emil. Tolerance to Alcohol. Its Mechanism and Significance. California & West Med 44: 262 (April) 1936

21 Remund M. H. Gerichtlich Medizinische Erfahrungen und Probleme bei Automobilunfällen. Habilitationsschrift. Basel. Schwabe u. Co. 1931

22 Jungmichel Gottfried. Alkoholbestimmung im Blut. Methodik und forensische Bedeutung. Berlin. C. Heymann 1933

23 Schwarz Fritz. Einige Erfahrungen bei der Durchführung der quantitativen Alkoholbestimmung. Schweiz. med. Wchnschr. 67: 54 (Jan. 16) 1937

24 Hoffmann Kurt. Alkoholnachweis bei Verkehrsunfällen. Berlin. Urban & Schwarzenberg 1937

25 Widmark E. M. P. Die theoretischen Grundlagen und die praktische Verwendbarkeit der gerichtlich-medizinischen Alkoholbestimmung. Berlin. Urban & Schwarzenberg 1932

19 Harger R. N. A Simple Micromethod for the Determination of Alcohol in Biologic Material. J. Lab. & Clin. Med. 20: 746 (April) 1935

munication Dr Bogen stated that the percentages quoted in his paper represent persons who were definitely drunk and that the percentages of persons "under the influence of liquor" were considerably higher.

An examination of table 2 will show that, while there is a good correlation between the level of alcohol in the body and intoxication this correlation is not perfect. As pointed out by Widmark<sup>2</sup> and others, there is a zone, in which the concentration extends from about 0.8 part of alcohol per thousand up to 1.5 parts of alcohol per thousand (from 0.08 to 0.15 per cent by weight), in which a diagnosis of "under the influence of alcohol" would not apply in all cases. In this zone the probability of a person's being under the influence of alcohol increases with rise in the level of alcohol in the body. A careful study of the literature, as well as our own observations, has convinced us that all subjects having a level of alcohol in the body above 1.5 parts per thousand (0.15 per cent) are sufficiently impaired to be unsafe automobile drivers and that a level above 1.5 parts per thousand should be prima facie evidence that the person is under the influence of alcohol. When one applies Widmark's factor 1,<sup>2</sup> which means the ratio of the alcohol in the blood to the alcohol in the entire body, a level in the blood of 1.5 parts per thousand corresponds to an accumulation of from 3 to 3½ ounces (90 to 105 cc) of alcohol, or from 6 to 7 ounces (180 to 210 cc) of whisky, in the body of a person weighing 150 pounds (68 kg). When the level of alcohol in the blood is between 0.8 and 1.5 parts per thousand this fact should be recorded and used as additional evidence if the usual symptoms of alcoholism are present.

The maximum concentration of alcohol which should be permitted in the body of an automobile driver depends on the definition of "under the influence of alcohol." Miles,<sup>26</sup> Heise,<sup>2</sup> Schmidt,<sup>27</sup> Elbel<sup>28</sup> and others<sup>29</sup> have shown that concentrations even lower than 0.8 part per thousand, which are usually insufficient to produce gross symptoms of intoxication, are capable of reducing the driving efficiency of many people. This point was stressed in a recent report by the American Medical Association's committee for the study of motor vehicle accidents.<sup>31</sup>

#### COMMENT

With subjects having high concentrations of alcohol in the body, our results indicate a tendency for the weight of alcohol in the breath accompanying 190 mg of carbon dioxide to be somewhat lower than the amount of alcohol per cubic centimeter of blood. This may be due either to a depression of the respiratory center, resulting in elevation of the carbon dioxide tension in the blood and the alveolar air or to the test's passing the end point of the purple fluid on account of the small volume of breath used. The second explanation is indicated by data secured by omitting the permanganate solution and analyzing the alcohol absorbed by the sulfuric acid by our microdichromatic method.<sup>12</sup>

Most of our determinations were done with 0.5 cc of the permanganate solution, and we believe that increasing the amount to 1 cc, according to the directions given, will help to eliminate errors due to passing the end point. While the measurement of the volume of breath required to decolorize the purple fluid gave satisfactory results, we feel that this should be checked by determination of its carbon dioxide content. The latter procedure is of course necessary with subjects who will not or cannot cooperate.

As pointed out by Bogen,<sup>9</sup> nonalcoholic subjects who simply rinse out the mouth with a strong alcoholic beverage such as whisky will exhibit alcohol in the breath for a short time afterward. However, as shown by Bogen and confirmed by ourselves, this effect is almost gone in five minutes and entirely disappears after about ten minutes. For this reason a period of at least ten minutes should elapse between the taking of alcoholic fluids into the mouth and the collection of the breath. In the practical testing of automobile drivers this source of error seems unimportant, but it should certainly be recognized by persons using the method.

Although the preliminary test and most of the quantitative procedure may be carried out by a person with little chemical training, we strongly urge that persons using the method have the assistance of a local chemist, who can weigh the Ascarite tubes and check the composition of the solutions. Whenever possible the subject should be examined by a physician, and the employment of a competent physician or toxicologist will greatly aid in presenting the case in court.

The method described in this paper will probably not predict the concentration of alcohol in the brain quite as closely as analysis of blood, but we believe that the results are amply accurate for practical purposes. In addition to being used in medicolegal cases, it may aid, when the pump is used, in differentiating alcoholic coma from coma due to other causes.

The Indiana State Police and Dr. Preston M. Nesbit of Arlington, Texas, cooperated in trying out the method with automobile drivers. In the experiment conducted by the Indiana State Police, most of the persons who the test indicated were under the influence of alcohol pleaded guilty, and in most cases in which the defendant did not plead guilty the evidence of the test was accepted by the courts and convictions resulted. In a recent communication Dr. Nesbit reported the use of the test on ninety-three automobile drivers suspected of being under the influence of alcohol. Of these, seventy-nine were declared to be under the influence of alcohol on the basis of the test and physical appearances, and all pleaded guilty.<sup>32</sup>

It should be emphasized that chemical tests for intoxication should not exclude evidence such as observations of eyewitnesses and physical tests but that chemical tests will give additional information, which is often sorely needed. Such tests will exonerate the non-drinker and even the mild drinker, and they will show the concentration of alcohol in the drinker's brain.

#### SUMMARY

1. A reagent for alcohol in the breath consists of 55 per cent sulfuric acid containing a small measured amount of permanganate solution. The permanganate reacts rapidly and quantitatively with alcohol at ordinary temperatures and is not affected by acetone.

<sup>26</sup> Miles, W. R. Alcohol and Human Efficiency. Experiments with Moderate Quantities and Dilute Solutions of Ethyl Alcohol on Human Subject. Publication 333. Washington, D. C. Carnegie Institution of Washington, 1924.

<sup>27</sup> Heise, H. A. Alcohol and Automobile Accident. J. A. M. A. 107: 732 (Sep. 8) 1914.

<sup>28</sup> Schmidt, Max. Concentration of Alcohol in Blood. J. Indust. Hyg. & Toxicol. 16: 335 (Nov.) 1914.

<sup>29</sup> Elbel, Herbert. Blutalkoholkonzentration und Alkoholkirkung. Deutsche Zeitschrift für gerichtliche Medizin. 24: 64 (March) 1937. Zur Frage der Bewertung von Blutalkoholbefunden. Münchener Medizinische Wochenschrift. 81: 1133 (July 16) 1937.

<sup>30</sup> Effects of Alcohol on Drivers of Motor Vehicles. Berlin Letter. J. A. M. A. 109: 1176 (Oct. 23) 1937.

<sup>31</sup> Preliminary Report of Committee to Study Problems of Motor Vehicle Accidents. J. A. M. A. 108: 2137 (June 19) 1937.

<sup>32</sup> Two of the drivers at first pleaded not guilty and a third their cases to the District Criminal Court but they changed their pleas to guilty before their cases were tried.

2 The ratio of alcohol to carbon dioxide in the breath may be used to measure the concentration of alcohol in the blood. The weight of the alcohol accompanying 190 mg of carbon dioxide in the breath is very nearly equal to the weight of the alcohol in 1 cc of the subject's blood.

3 Employment of the ratio of alcohol to carbon dioxide in the breath permits the test to be done without the subject's being touched. A tube is held in the breath stream and a pump draws the sample through the apparatus.

4 Tests made on 121 subjects showed a good correlation between the concentration of alcohol in the blood and the amount of alcohol accompanying 190 mg of carbon dioxide in the breath.

5 As collected in our tests, 4 liters of expired air contained about the same amount of alcohol as 1 cc of the subject's blood. Because of possible fluctuations in the amount of alveolar air in such samples, it is believed that analyses of breath made on the volume basis should be checked by determining the carbon dioxide in the sample.

## FACTORS IN THE MORTALITY RATE OF ARTERIOSCLEROTIC GANGRENE

A COMPARATIVE STUDY OF 214 CASES OF  
SURGICAL INTERVENTION

JAMES ROSS VEAL, M.D.  
NEW ORLEANS

The various persons and groups of persons who have devoted themselves within the last few years to the subject of peripheral vascular disease in its many manifestations have merited the highest praise. The results which they have achieved have in themselves been brilliant and have had the further effect of bringing to the forefront of medical consciousness, as it were, a group of diseases formerly relegated to the background because their prognosis was so hopeless.

Particularly in the obliterative type of peripheral vascular disease, however, all these recent endeavors have been on the prophylactic side and have had as their basic purpose a prompter anticipation and recognition of the impending terminal gangrene, with the institution of active measures to avoid its development. This is as it should be, for prophylaxis is always more to be desired than curative therapy. Yet there is another side of the picture, which must not be forgotten. One gains nothing by not facing the fact that even a more general adoption of prophylactic measures will not produce the millennium as far as peripheral vascular diseases of the obliterative type are concerned. The occasional private patient and probably the majority of public charges will continue to exhibit some degree of terminal gangrene and a large number of the latter will probably continue to exhibit massive gangrene. There is no doubt therefore that physicians should continue to devote their attention to this sorry subject and should continue their attempts to improve results in the management of the terminal state.

Two years ago McFetridge and I<sup>1</sup> published from the New Orleans Charity Hospital for the five year

period ended in 1933 an analysis of 171 amputations for primary vascular disease of the extremities, for which the mortality was 39.1 per cent (sixty-seven cases). In the group were 110 cases of arteriosclerotic gangrene, in which the mortality was 39 per cent (forty-three cases). During the last three and a half years 104 amputations for the same condition were performed in the same institution by essentially the same group of surgeons and, presumably, on essentially the same type of subject. The mortality in the second series was 28.8 per cent (thirty cases), which, although still intolerably high, is materially lower than in the first series, and the reduction seems worthy of investigation.

It might be well, before entering on this analysis, to make certain general statements about arteriosclerosis. It is a systemic disease which implies a generalized degeneration of the whole vascular tree. Gangrene is merely a localized manifestation of systemic pathologic change, a local warning, if I may so express it, of generalized vascular deficiency. The underlying vascular change is an obliterating endarteritis that affects all the vessels of the body from the thoracic aorta to the finest radicles. The nongangrenous parts of the vascular tree are still in a state of compensation, but the margin of safety is slight, and undue strain or stress—such as might be supplied by amputation of the local affected area, for instance—may bring about failure of the entire system. The vital organs, particularly the kidneys, the myocardium and the brain, have been so injured by impairment of the circulation that they are literally in a state to which the term "locus minoris resistentiae" may properly be applied.

If these facts are accepted, as they must be by all thinking surgeons, it is clear that the systemic reaction in arteriosclerotic gangrene is considerably more important than the local reaction. It is clear also that arteriosclerotic gangrene carries per se a certain inevitable death rate. But it is equally clear that failure to comprehend the systemic nature of the disease will add to that death rate, while due regard for it is likely to lower the mortality. Furthermore, certain definite factors, some controllable by the physician and some by the patient, also have their part. These include the extent and the duration of the gangrene, its exciting cause, the age of the patient, the presence of a systemic febrile reaction before operation, the site of amputation and the development of recurrent gangrene, infection or slough of the stump. All these factors are important in varying degrees, but it is not too much to say that not one of them is as important as is the preoperative and postoperative management of the patient. Indeed, one may go further and make the unqualified statement that by the attention he devotes to this particular phase of therapy the surgeon expresses his regard for and comprehension of the patient's systemic disease.

The extent of the gangrene has a twofold significance. It bears a direct relation to the degree of vascular occlusion, and it also is an index of the duration of the process. Since arteriosclerotic gangrene is known to spread slowly, it may reasonably be assumed that a patient who has gangrene confined to one toe or several toes either has less vascular occlusion or a disease of shorter duration than a patient who has gangrene involving the entire foot. In only ninety-one of the total of 214 cases in both series was the gangrene still confined to the toes, and it is not surprising to find that in this group the mortality was only 29.6 per cent (twenty-seven cases), as compared to a mortality of

From the Louisiana State University School of Medicine and Charity Hospital.

<sup>1</sup> Veal J. R. and McFetridge E. M. The Surgery of Gangrene of the Extremities. With a Study of 171 Cases from the Records of Charity Hospital in New Orleans. Surg. Gynec. & Obst. 60: 840-847 (April) 1935.



48.5 per cent (thirty-four cases) for the group of seventy cases in which the gangrene involved half or more of the foot.

It is clear from these figures that delay is one of the most important controllable factors in the treatment of arteriosclerotic gangrene. On the part of the patient it may be at least partially controlled by educational methods. A person who is under a physician's care

of amputations at Charity Hospital offers no explanation of the more than 10 per cent difference in the mortality rates. The average age of the 110 patients in the first series was 64.2 years and of the 104 patients in the second series 63.6 years. A variation of less than a year in age cannot logically be invoked to explain a variation of more than 10 per cent in mortality.

Chart 1 is a graphic presentation of the mortality rates by decades in the two series. If one disregards the patients under 40 years of age, who do not appear at all in the first series and are too few in the second to warrant any deductions, two tendencies are plain, the increase in the death rate in both series with advancing age and the materially decreased death rate in the younger groups in the second series. There is practically no difference as I have said, in the age of the patients in the two series, but it is not surprising to find the average age of death in the first series 67.8 years, more than three years higher than the average age for the whole group (64.2 years), and in the second series 69.3 years, almost five years higher than the average age for the whole group (63.6 years).

It is entirely reasonable that the exciting cause of the gangrene should definitely influence the mortality rate and that spontaneous gangrene should carry a higher death rate than the traumatic variety. Many patients in whom trauma is the exciting cause have an adequate peripheral circulation in spite of their disease. The trauma is accidental and extrinsic. Their general condition therefore is better, their vital organs are less seriously damaged and they have a correspondingly greater chance of survival than the patients in the other group, whose gangrene has developed spontaneously as a result of their disease. It is not necessary to labor the point that in this second group the arteriosclerosis is more severe and the arterial obliteration more extensive. Practically all such patients give a history extending over months or even years of such preliminary signs and symptoms as cold feet, ischemic pain at night, changes in color and intermittent claudication. In the first series the mortality for traumatic gangrene was 32.5 per cent, against 40.4 per cent for spontaneous

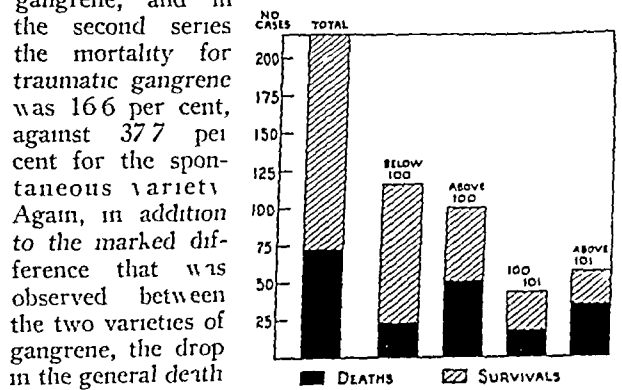


Chart 2—Relation of preoperative fever to mortality rate

for arteriosclerosis should be warned whenever the opportunity arises of the hazards of gangrene and should be made to realize that when once it has set in prompt treatment is life saving. It is obviously impossible to warn patients who do not submit themselves to medical treatment for their systemic disease, and it is just as well to face the fact that patients of the general level of intelligence seen in Charity Hospital and in similar public institutions will be likely always to present themselves late.

But the delay is not always the patient's fault. He may present himself late for treatment, he may refuse operation when it is offered, but it is not always offered. At least part of the mortality due to delay must be charged against the physician who, because of carelessness or from the worthier, though no less dangerous, motive of conservatism, postpones employment of radical measures beyond the limits of safety. Often, of course, the physician finds himself on the horns of a dilemma. All his instincts are against mutilating surgery, all his instincts are to practice conservatism. But when public charges, of a generally low level of intelligence and with the advanced type of disease that inevitably follows, are in question, conservatism is frequently neither practical nor safe. Usually the attempt at salvage fails, and frequently the patient pays for it with his life. To quote from our earlier paper on this subject: "The surgeon who procrastinates, no matter how worthy his motives may be, adds to the death rate in gangrene just as surely as does the patient who delays presenting himself for treatment or who refuses surgery when it is offered to him."

Arteriosclerosis is a progressive disease. It develops in middle life or later as a rule, and as the patient grows older progressively greater destruction of the vascular bed occurs with as I have pointed out progressively greater involvement of the vital organs, particularly the heart, the kidneys and the brain as well as the peripheral blood vessels. It is clear then that the older the patient is when his gangrene develops the poorer the surgical risk he presents. On the other hand an analysis from the standpoint of age of the two series

To avoid misunderstanding, it might be well to call attention to one exception to the statements I have just made. In the so-called arteriosclerotic disease spontaneous gangrene of the toes may occur early while other parts of the cardiovascular system may in general be entirely adequate. This, however, is a specific type of arteriosclerosis and its particular phenomena do not invalidate the points I have made concerning the etiologic factor in arteriosclerotic disease.

The susceptibility to infection of the patient with diabetic gangrene is generally realized. It is not so generally realized, however, that the arteriosclerotic subject manifests the same susceptibility, although in a more sluggish manner. As we pointed out in our previous communication on this subject, infection in the arteriosclerotic patient is deep seated, a sort of underground process that spreads along tissue planes and only rarely manifests itself in a true line of demarcation. If it is not actually present it is potentially present. The gangrene may begin as a dry type, in contradistinction to the moist type of diabetic gangrene, but infection is only a matter of time, and, just as in the diabetic patient, the infection increases the gangrene and the gangrene increases the infection.

It is true that the constitutional reaction is not so marked in the arteriosclerotic as in the diabetic patient. The former shows his toxicity chiefly as a lack of well being. He manifests indifference to the intake of food and fluid, reduction of the liquid output, listlessness and drowsiness that at times approach actual stupor, and often a mild senile dementia that is indicative of involvement of the cerebral vessels. I have been particularly impressed by this picture in the Negro men's wards, and, as I shall point out shortly, the improvement in results has been most gratifying since my co-workers and I have realized its significance and endeavored to correct it.

Infection associated with a febrile reaction apparently has an important bearing on the mortality rate when it is present prior to amputation (chart 2). In the first series, fifty-five of 110 patients had a temperature of 100 F or more before operation, and thirty-two, or 58.1 per cent, died. In the second group, forty-four of 104 patients had a temperature of 100 F or above before operation and eighteen or 40.8 per cent, died. In the first series thirty-nine patients had a temperature of 101 F or more before operation, of whom twenty-six, or 66.6 per cent, died. In the second group eighteen had a temperature of 101 F or more before operation, of whom seven, or 38.8 per cent, died. The lowered mortality in the second series was unquestionably due to a fuller comprehension of the dangerous state of the patients, and, as I shall point out shortly, correspondingly more careful preparation.

Combining the figures for the two series, one finds that ninety-nine of the total of 214 patients had a febrile reaction with a temperature of 100 F or more before operation and that fifty, or 50.5 per cent, died. Fifty-seven had a temperature of 101 F or more, of whom thirty-three, or 57.8 per cent, died. The influence of infection on the death rate can be illustrated even more clearly by the reverse of this picture. Of the 115 patients in whom no febrile reaction existed before operation only twenty-three, or 20 per cent, died. It seems scarcely necessary to add that the longer the toxemia existed the higher was the mortality, arteriosclerotic subjects and particularly aged subjects, do not tolerate infection well.

The question of where to amputate in cases of primary vascular gangrene is perhaps the most controversial question regarding the management in such cases. Here again the surgeon is on the horns of a dilemma. He does not wish to amputate higher than is actually necessary, not only for economic and cosmetic reasons but because other things being equal the higher the amputation the higher the mortality. Yet if he amputates too low and the circulation in the area proves

inadequate the patient runs the chance of recurrent gangrene, which carries with it a risk many times higher than the original risk.

The proportion of amputations at the various sites (chart 3) is widely different in the two series under discussion, as is the distribution of the mortality, and it is worth while to consider these differences in detail. In the first series the mortality for amputations of the toe was 11.7 per cent (seventeen cases with two deaths) against 16.6 per cent in the second series (six cases with one death), the smaller number of cases in the second series obviously making the comparison unsound. In the first series the mortality for amputations of the leg was 34 per cent (forty-seven cases with sixteen deaths), against 20.6 per cent in the second series (twenty-nine cases with six deaths). In the first series the mortality for amputation at the thigh was 55.5 per cent (forty-five cases with twenty-five deaths) as compared with a mortality of 33.3 per cent in the second series (sixty-nine cases with twenty-three deaths). What is responsible for the marked decrease in the mortality of the second series, in which actually the proportion of presumably lethal amputations at the thigh was far higher than in the first series?

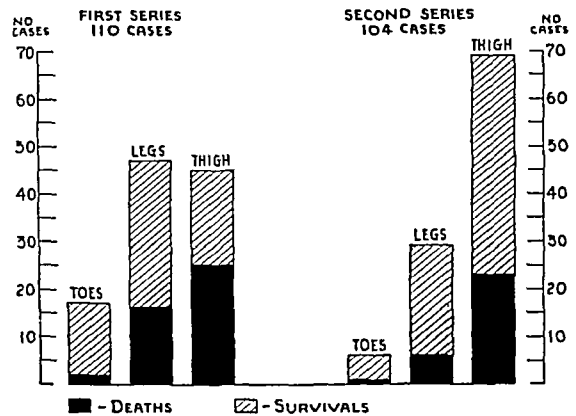


Chart 3—Mortality in relation to site of amputation

Undoubtedly the reason for the lowered mortality for the more dangerous operation was a more careful selection of cases, a more uniform endeavor to determine the lowest level of adequate circulation. That endeavor, regrettably, was still not entirely uniform, but there was a marked improvement over the frankly haphazard methods of the first series. There is still, of course, no general agreement as to how the level of adequate circulation is to be determined. Age is not a safe guide, nor is the gross appearance of the limb. My co-workers at the Charity Hospital and I agree with McKittrick<sup>2</sup> that the only adequate clinical sign is the presence of palpable popliteal and tibial pulses. If these are missing other methods must be resorted to, most of which are still too intricate to be used by surgeons who do not have access to the facilities of a well equipped hospital. Arteriography,<sup>3</sup> which we feel is the most adequate method, falls into this category. It cannot be used as a matter of routine and it is of value only in the hands of men who use it regularly and who have had a wide experience with it. The

<sup>2</sup> McKittrick, L. S. Indications for Amputation in Progressive Arterial Obliteration of the Lower Extremities. *Ann Surg* 102: 342, 350 (Sept.) 1935.

<sup>3</sup> Veal, J. R. and McFetridge, E. M. Adequate Circulation in Extremity: Arteriography as a Test for Determining Limits. *J. A. M. A.* 101: 542-545 (Feb. 16) 1935.

histamine test, as compared with it, has not been satisfactory in our hands, but the salt absorption test of McClure and Aldrich,<sup>4</sup> which we have used frequently during the last three years, seems reliable.

The test is so simple that it is susceptible of general use. Intradermal injections of 0.2 cc. of physiologic solution of sodium chloride are made at 3 inch intervals on the inner aspect of the leg from the ankle to the upper third of the thigh, the rate of absorption of the resulting wheals being used as an index of the adequacy of the circulation at each level. When the circulation is normal the rate of absorption is slow and the wheals persist for an hour or more. When the circulation is impaired the rate of absorption is uniformly increased from above downward, some of the wheals are completely absorbed at the end of five minutes. As we have employed the test, we regard the circulation as adequate at and above a given level if the wheal at that level is half of its original size at the end of an hour.

It must be remembered that the mere existence of adequate circulation at a certain level by no means guarantees primary healing. Primary healing, for instance, occurred in only thirty-five of the fifty-four patients in both series who survived leg amputations.

Other considerations, too, enter into the question of primary healing, notably certain points in operative technic. We consider the circular type of amputation most satisfactory and used it in practically all our cases. Speed, while both desirable and essential, especially in the case of aged and debilitated patients, does not take the place of careful technic. Ragged incisions and trauma to the tissues will further impair the already precarious terminal circulation. Bleeders must be tied securely, but hemostasis should not be achieved by the use of sutures through the muscle layers. Sutures through the muscles, fascia and skin should be tied just tightly enough to approximate the layers, undue tension will result in slough or further gangrene. Every surgeon is familiar with the type of case in which the circulation is apparently adequate at the level selected for amputation but in which, because tight mass sutures were applied, the terminal vessels were completely cut off and gangrene of the stump resulted.

The status of the circulation at the site of amputation is, as I have said, the most important basic factor in determining primary healing. If it is inadequate, recurrent gangrene or massive sloughs will almost inevitably result. In the first series the incidence of recurrent gangrene in cases of amputation of the toes was 47 per cent (eight of seventeen cases), against 50 per cent in the second series (three of six cases), which is not materially different. In the first series the incidence in cases of leg amputation was 34 per cent (sixteen of forty-seven cases), against 27.5 per cent in the second series (eight of twenty-nine cases). In the first series the incidence in amputations at the thigh was 89 per cent (four of forty-five cases), against 57 per cent in the second series (four of sixty-nine cases). In addition to the decreased incidence in the second series in both leg and thigh amputations, the high proportion of recurrence of the gangrene in both series when amputation of the toes was done is striking in contrast to the low incidence in both series when amputation at the thigh was employed. Such contrasts prove again the dangers of conservatism in the treatment of this disease and suggest that at least in some cases the

risk of a higher mortality for a more dangerous operation may be justified, it must not be forgotten that reamputation for recurrent gangrene carries in almost prohibitive mortality.

Gas gangrene as a complication of amputation has been particularly emphasized by Eliason and Callendar, but with us<sup>5</sup> it has not been an outstanding problem. This is rather surprising because of our high proportion of Negro patients (149 of the total 214) and their known predilection for this special type of infection. Certainly our overcrowded wards and the Negro's elementary ideas of personal hygiene would seem to make him a fit subject. The incidence may perhaps be higher than we realize, for we have not practiced making routine cultures of material from infected stumps or stumps which exhibit recurrent gangrene. On the other hand, this type of infection is so distinctive that we doubt that we have overlooked many cases.

As is usual after amputation, most stumps in both series showed some exudation of serum, and a regrettably large number showed some degree of infection. It must not be assumed that such phenomena are part of the normal healing process. They are not. Both exudation and infection, however mild they may be, produce some swelling of the tissues, which in turn reduces the supply of blood to the part and may eventually lead to serious trouble. The temperature and the pulse rate are not reliable indexes of the presence or absence of infection in the stump. Direct observation is necessary and daily dressings must be a matter of routine. If swelling produces the slightest tension on the sutures they must be promptly removed, and active measures must be taken at the first sign of infection. Infection of the stump is not infrequently associated with thrombophlebitis and lymphangitis, and these local conditions may serve as a focus of infection elsewhere, which is a point not usually considered.

There is no question in our own minds but that the most important single factor in the decreased mortality in the second series of amputations for arteriosclerotic gangrene was the careful and systematic preoperative and postoperative management which most of these patients received as compared with the hit and miss preparation and after-care which many of the patients in the first series received. The change in management was based on the new conception of arteriosclerotic gangrene, which I have already emphasized, that it is a systemic consideration first and a local consideration second. As a rule the patient at Charity Hospital with this type of gangrene is admitted from several weeks to several months after it has developed. He is likely to be poorly nourished, dehydrated and toxic, and he has other liabilities, usually he is an old man—even the patients in middle life tend to be much older organically than their actual years—and he has the disabilities of age, chiefly cardiac and renal disease, associated with a general weakening of his vital powers. Even with adequate preparation such patients are often not good surgical risks, and without adequate preparation amputation is many times equivalent to execution. Failure to realize the significance of these facts was at least partially responsible for the high mortality in the first series, while its rather general realization was undoubtedly responsible for the lowered death rate in the second.

The method of preparation and after-care needs no detailed description. There is no undue delay in operat-

<sup>4</sup> McClure, W. B. and Aldrich, C. A. Time Required for Disappearance of Intradermally Injected Salt Solution. *J. A. M. A.* 51: 293-295 (July 28) 1923.

<sup>5</sup> Veal, J. R. Study of Gas Perilous Infection with Reference to Its Occurrence in the Negro. *New Orleans M. & S. J.* 432-37 (Feb.) 1937.

tion, and preparation for it is begun immediately in those cases in which it is indicated. A perverted water balance is corrected by the free use of fluids. Renal function is estimated and the urinary output is improved. The cardiac reserve is tested and medical consultation sought as necessary. Infusions of dextrose solution are a routine preoperative measure. As a result of these precautions the majority of patients stand operation well. Similar treatment is continued postoperatively as long as it is necessary. Special attention is paid to the use of infusions of dextrose solution and other methods to prevent and combat shock, and transfusion is employed as the need arises. The patients are moved about in bed after operation and gotten up in chairs at the earliest possible moment, to forestall respiratory complications. As a result of these measures the patients in the second series were, case for case, far better surgical risks than the patients in the first series, though their gangrene, generally speaking, was no less extensive and their systemic disease was no less severe.

I have already discussed the importance of watching for and treating even mild infections after operation, and it remains to mention one other precaution. Every effort should be made to maintain the circulation of the stump at its optimum level, which is not achieved, in my opinion, by the usual practice of elevating it on a pillow at a level higher than the heart. I believe that a reverse plan should be followed and passive venous congestion produced by placing the stump lower than the level of the heart. This is best accomplished by placing it on a thin, soft pillow and elevating the head of the bed 12 inches. A heat cradle is also used, the temperature of which at the level of the stump should not be higher than 100 F.

With the change in the general management and the consequent reduction in the mortality, it is of interest to compare the causes of death in the two series. In chart 4, A and B are graphic presentations of the proportionate distribution of the causes of death in the two series, and chart 4 C is a composite picture of the causes of death in thirty cases in which autopsy was done. It will be noted that the latter corresponds closely to the clinical analyses of the causes of death.

Three marked differences are immediately apparent: a marked reduction in the proportion of deaths from complications involving the kidneys, a marked reduction in the proportion of deaths from shock and a rather marked rise in the proportion of deaths from cardiac failure.

The reduction in the number of deaths from kidney disease (most often acute or chronic nephritis, with or without uremia) and from shock has unquestionably been brought about by the improved preoperative and postoperative care, on which I have already commented. Particularly important in this connection is the free use of fluids in the form of hypodermoclysis and infusion. Yet the rise in the proportion of deaths from cardiac failure is disquieting and warrants investigation. In this category are included the cases of congestive failure and coronary thrombosis in which the cardiac reserve is low, and the added stress and strain of surgical intervention, no matter how careful the preparation, may be enough to turn the tide against the patient.

Also included are the cases in which the cardiac reserve may be sufficient to withstand the strain of operation but not the added toxemia from infection of the stump. Another disappointing type of case included, which is unfortunately familiar to all surgeons, is that in which

the patient passes safely through the ordeal of operation, only to succumb to cardiac failure when he resumes his activity.

I am particularly concerned in this group of deaths with the patients who died of cardiac failure associated with acute pulmonary edema. Not inconceivably some of those deaths were due to the very measures adopted to reduce the proportion of deaths from kidney diseases and from shock. The pulmonary edema might reasonably have been produced by a too liberal use of salt solution. The work of Coller, Dick and Maddock<sup>6</sup> on this type of edema is enlightening, and their suggestion that dextrose be substituted for an excess of saline solution could well be followed in treating aged arteriosclerotic subjects.

The small reduction in the number of deaths from pneumonia is encouraging and is probably due to a reduction in the incidence of the hypostatic type of disease. It is not surprising, in view of the age of the patients, that pneumonia should continue to be the principal cause of death. At their period of life chronic bronchial infections are frequent, and few patients of the social stratum included in this report are free from dental sepsis.

There is reason to believe too that in some cases pneumonia may be due to showers of emboli from the

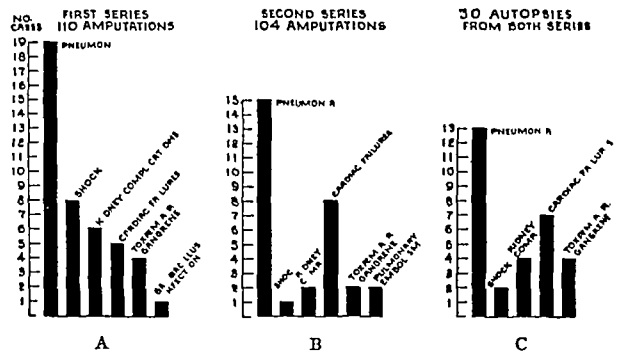


Chart 4—Causes of death after operation

amputated stump. In many cases the onset and the clinical course suggested an embolic rather than an infectious origin, and in some cases, when x-ray examinations were made early in the course of the illness, multiple small shadows suggesting infarcts were revealed.

#### SUMMARY

1 Arteriosclerotic gangrene is the local manifestation of a systemic disease.

2 Factors in the mortality include the extent and duration of the gangrene, its exciting cause, the age of the patient, the presence of a systemic febrile reaction before operation, the site of amputation, the development of recurrent gangrene, infection or sloughs after operation and, most important of all, the preoperative and postoperative measures employed. The last consideration, although it is not generally realized, is quite as important in treating the arteriosclerotic patient as in treating the diabetic patient.

3 In two series of amputations for arteriosclerotic gangrene, including, respectively, 110 and 104 cases, analyzed in detail from the standpoint of these factors, the mortality in the second was more than 10 points lower than that in the first.

<sup>6</sup> Coller F. A. Diet V. S. and Maddock W. G. Maintenance of Normal Water Exchange with Intravenous Fluid. J. A. M. A. 107: 1522-1527 (Oct. 7) 1936.

## VAGINAL TAMPONAGE FOR CATAMENIAL SANITARY PROTECTION

LLOYD ARNOLD, M.D.  
AND  
MARIE HAGELE, R.N., M.S.  
CHICAGO

Temporary vaginal tamponage for the purpose of collecting the catamenial discharge has been practiced by women of certain professional groups, such as acrobats and dancers, who cannot wear the usual sanitary pad because of visibility through their costumes. Many of these women, however, have abandoned tampons for small vulval pads which are inserted between the lips of the vulva and collect the exudate during the

TABLE 1—Data on an Average Normal Woman

Subject Stenographer aged 30, height 5 feet 6 inches (166 cm) weight 135 pounds (61 kg) Weight of each pad 11.9 Gm weight of each tampon 3.7 Gm

Number of Tampon and Pad	Hours Worn	Total Amount Absorbed Gm	
		Tampon	Pad
1	5 30 a m to 11 00 a m	2.7	0.2
2	11 00 a m to 4 00 p m	11.8	4.1
3	4 00 p m to 11 00 p m	11.3	1.1
4	11 00 p m to 7 00 a m	11.3	1.1
5	7 00 a m to 10 00 a m	8.0	0.4
6	10 00 a m to 4 00 p m	5.4	0
7	4 00 p m to 10 00 p m	10.0	1.1
8	10 00 p m to 7 00 a m	0.8	0
9	7 00 a m to 4 00 p m	5.3	0
		(mostly urine)	
Total		66.6	8.0

short interval in which they require such protection. Self tamponage has within the last few years been advocated by a few tampon manufacturers, and tampons have been used for catamenial sanitary protection in place of the usual sanitary pads. The purpose of our investigation was to determine the efficiency of tampons in collecting the catamenial discharge of normal women.

Ninety-five women were studied, and three different makes of tampons were purchased and used in the experiments.

Tampon A is made of cotton, the fibers run crosswise and are compressed into a cylinder one-half inch in diameter and 3 inches long. The tampon is enclosed within two sleeves of stiff glazed paper. The larger sleeve has a diameter of nine-twelfths inch and the smaller, or plunger tube, has a diameter of one-half inch, both are 3 inches long. The tampon is almost completely inserted in one end of the larger sleeve, and the smaller sleeve or plunger, is inserted in the other end. The larger sleeve is inserted into the vagina, and by pressure on the plunger tube the tampon is pushed into the lumen. A string extends 7 inches from the tampon for aiding in removal. The tampons weigh on an average 3.5 Gm without the stiff glazed paper sleeves.

Tampon B is made of absorbent wadding formed into a cylinder nine-sixteenths inch in diameter and 2 inches in length. Six loosely braided strings cover and hold the wadding core in shape. A thin layer of cotton covers this cylinder, attached by means of a

starch film. This cotton covering is quilted down with sixteen similarly braided fine threads, each securely attached to the cotton covering. The proximal end of the tampon is pressed into a rounded shape to facilitate insertion. A silk thread is securely attached to aid in removal. The tampons weigh on an average 1.8 Gm.

Tampon C has a core of ten circular layers of gauze, 1½ inches in diameter, between two layers of cotton. Each layer of cotton is a thin strip one-half inch wide and wound so as to make a flat roll 1½ inches in diameter and one-half inch thick. This forms a sphere of very soft, yielding cotton. A mercerized cotton strip is securely attached and used for removal of the tampon. The average weight is 3 Gm.

Tampons A and C increase in size when placed in fluid in an unconfined space. Tampon B retains its original size under the same conditions.

Our subjects included housewives, clerks, factory workers, laboratory technicians and professional women such as nurses, physicians, artists and business executives, the ages varied from 18 to 46 years. The general plan of our procedure was as follows:

Twelve tampons and an equal number of sanitary pads, individually weighed and numbered, were given

TABLE 2—Data on a Subject Who Obtained Complete Protection with Two Types of Tampon and Almost Complete Protection with the Third

Subject Factory worker aged 24 height 5 feet 3 inches (160 cm) weight 115 pounds (52 kg)

Number of Tampon and Pad		Hours Worn	Total Amount Absorbed Gm	
			Tampon	Pad
A	Weight of Each Pad 12.3 Gm	Weight of Each Tampon 3.2 Gm		
1	3 30 p m to 9 00 p m	6.8	0	
2	9 00 p m to 5 00 a m	5.3	0	
3	5 30 a m to 1 00 p m	5.0	0	
4	1 00 p m to 7 30 p m	5.0	0	
5	7 30 p m to 5 30 a m	4.8	0	
6	5 30 a m to 4 30 p m	4.5	0	
7	4 30 p m to 5 00 a m	5.9 (urine)	0	
8	5 00 a m to 7 00 p m	6.2 (urine)	0	
9	7 00 p m to 10 30 p m	3.4 (urine)	0	
Total			44.9	0
B	Weight of Each Pad 11.7 Cm	Weight of Each Tampon 1.6 Cm		
1	4 00 p m to 12 00 p m	4.0	0	
2	12 00 p m to 8 00 a m	1.9	0	
3	8 00 a m to 2 00 p m	2.0	0	
4	2 00 p m to 7 00 p m	6	0	
5	7 00 p m to 8 30 a m	5.8	0	
6	9 00 a m to 8 00 p m	4.2	0	
7	8 00 p m to 8 00 a m	2.7	0	
8	8 00 a m to 5 00 p m	4.4 (some urine)	0	
9	5 00 p m to 9 30 a m	2.9 (some urine)	0	
Total			37	0
C	Weight of Each Pad 14.1 Cm	Weight of Each Tampon 2.6 Cm		
1	6 30 p m to 11 00 p m	9.7 (urine)	0	
2	11 30 p m to 11 00 a m	5 (urine)	0	
3	11 00 a m to 6 30 p m	14.0 (urine)	0	
4	6 30 p m to 11 00 p m	3.0	0.1	
5	11 00 p m to 11 00 a m	2.5	0	
6	11 00 a m to 8 00 p m	3.0	0	
7	8 00 p m to 10 30 a m	5.0 (urine)	0	
Total			43	0.1

to each subject. The time each was worn was recorded on a printed form. The exact time the tampon was inserted and the protective pad was put in place and removed was recorded. As soon as the tampons and pads were removed they were sent to the laboratory. Each tampon and pad was examined and weighed and

the amount of exudate in grams was recorded. We are recording only the objective data obtained from our investigation. It was thought best to exclude the subjective information obtained from questionnaires and from personal interviews conducted by nurses.

Table 1 represents an average normal woman. The amount of catamenial discharge (746 Gm.) and the duration of menses (sixty hours) are typical for the age group.

Table 2 A represents a subject who obtained complete sanitary protection by tamponage. Table 2 B shows the same subject using another type of tampon, smaller, but just as efficient. Table 3 illustrates a variation we have frequently observed and can be compared with table 1. Table 4 represents a subject belonging to the heavy-flowing group. We found that one third of our subjects came within this group.

The degree or relative efficiency of the tampons can be summarized briefly by grouping the amounts of catamenial discharge, in grams, absorbed by the pro-

their recently removed tampons. When the tampon has absorbed hemoglobin to the extent that it has a bloodlike color, it would be necessary to carry out a chemical analysis to ascertain whether urine also is present. We did not do this and hence could determine

TABLE 4—Data on a Subject Having a Heavy Flow

Subject: Nurse, aged 29, height 5 feet 3 inches (160 cm), weight 135 pounds (61 Kg). Weight of each pad 11.8 Gm, weight of each tampon 3.3 Gm.

Number of Tampon and Pad	Hours Worn	Total Amount Absorbed Gm	
		Tampon	Pad
1	5:00 p.m. to 7:00 p.m.	27	0.2
2	7:00 p.m. to 6:00 a.m.	167	0.2
3	6:00 a.m. to 9:00 a.m.	135	0.6
4	9:00 a.m. to 1:00 p.m.	100	0.2
5	1:00 p.m. to 7:00 p.m.	147	4.7
6	7:00 p.m. to 6:00 a.m.	140	5.4
7	6:00 a.m. to 12:00 a.m.	67	0.4
8	12:00 a.m. to 7:00 p.m.	82	0.7
9	7:00 p.m. to 7:30 a.m.	12	0.2
10	7:30 a.m. to 1:00 p.m.	107	2.7
11	1:00 p.m. to 9:00 p.m.	107 (small clot)	12.6
12	9:00 p.m. to 6:00 a.m.	13	0
13	6:00 a.m. to 9:00 p.m.	42 (some urine)	0
14	9:00 p.m. to 6:00 a.m.	12	0
15	6:00 a.m. to 4:00 p.m.	17	0
16	4:00 p.m. to 6:00 a.m.	20	0
Total		1195	42.9

TABLE 3—Data Illustrating a Frequent Variation

Subject: Housewife, aged 25, height 5 feet 3 inches (160 cm), weight 125 pounds (57 Kg). Weight of each pad 17.4 Gm, weight of each tampon 3.6 Gm.

Number of Tampon and Pad	Hours Worn	Total Amount Absorbed Gm	
		Tampon	Pad
1	10:30 p.m. to 6:00 a.m.	86	9.6
2	6:00 a.m. to 10:00 a.m.	24	1.1
3	10:00 a.m. to 12:00 a.m.	96	7.7
4	12:00 a.m. to 9:00 p.m.	46	0
5	9:00 p.m. to 7:00 a.m.	86 (some urine)	2.2
6	7:00 a.m. to 6:00 p.m.	43	0
7	6:00 p.m. to 9:30 p.m.	108	0.6
8	9:30 p.m. to 6:00 a.m.	60	0.2
9	6:00 a.m. to 4:30 p.m.	101 (some urine)	3.4
10	4:30 p.m. to 6:00 a.m.	10	0.4
11	6:00 a.m. to 1:00 p.m.	82 (mostly urine)	0
12	1:00 p.m. to 6:00 a.m.	02	0
Total		744 (including urine)	20.2

the presence of urine only by the visual and the olfactory sense in the absence of blood-stained tampons.

Blood clots were found adherent to the proximal end of the tampons from eighteen subjects. Questionnaires returned indicated that these eighteen women reported a "gush" of blood immediately after removal of the tampons. This would indicate that the adherent clot had reduced absorbency, hence the tampon acted as a plug, and the catamenial discharge was returned in the vagina proximal to the tampon. The ideal tampon should act as a wick after it has become saturated so that the exudate will pass downward from the distal end on to the vulva. We found that the tampons with the largest diameter were responsible for the obstruction of the catamenial discharge. Such obstruction occurred only when tamponage was used during the period of heaviest flow. It is obvious that free drainage of the uterine discharge should be maintained during menstruation.

Vaginal tamponage has been a medical procedure, and physicians have kept their patients under observation. Tampons are foreign bodies in the vagina. We

testing sanitary pads, that is, the amounts of exudate which passed the inserted tampons.

Tamponage has been advocated and advised for protection during the last part of the period. We found that the protecting sanitary pad was free from exudate during an average of thirty-two hours at the end of the menstrual period of seventy-seven subjects, or 81.1 per cent. Ten subjects (10.5 per cent) could not have used tampons without sanitary pads for the last day of their menstruation. The remaining eight subjects have been mentioned as being able to obtain complete protection throughout their periods by tamponage alone.

Four subjects refused to continue using tampon A after the first one was inserted, the remaining ninety-one subjects used this tampon. All ninety-five subjects used tampon B without complaint. Twenty-one subjects were unable to insert tampon C, hence we have records of only seventy-four complete menstrual periods, for the same number of women. We have records of 260 menstrual periods, for ninety-five subjects, 2,800 tampons were used in these tests.

The examination of the returned tampons in our laboratory indicated that many were saturated with urine. Sixty-five of the ninety-one subjects (72 per cent) who used tampon A, thirty of the ninety-five subjects (32 per cent) who used tampon B and 100 per cent of those who used tampon C showed urine on

TABLE 5—Amounts of Exudate Which Passed Through the Tampons

Grams of Exudate on Protective Sanitary Pads	Number of Subjects	Percentage of Total
None	8	8.4
0.1 to 2.0	26	26.4
2.6 to 5.0	11	11.6
5.1 to 10.0	17	17.3
Over 10.0	51	51.7
	113	100.0

do not know from experience how susceptible the vaginal mucosa may be to repeated irritation. When tampons are used regularly during the menstrual period periodic examination of the vagina should be made to ascertain whether the mucosa remains normal.

The epithelial cells in the vaginal mucosa are stimulated to cyclic periods of growth by the ovarian hor-

mones This cycle of accelerated proliferation may be associated with increased susceptibility to mechanical irritation

#### CONCLUSIONS

Ninety-five women, aged from 18 to 46, used self tamponage for catamenial sanitary protection. Each wore a sanitary pad and returned both tampon and protecting pad for examination. Eight women did not need the protecting pad since tampons afforded complete protection. Eighty-seven (91.6 per cent) needed more protection than was provided by any of the three types of tampons used. Seventy-seven (81.1 per cent) women could have used tampons alone during the last part of their period.

### PRIMARY OBLITERATIVE PULMONARY ARTERIOLAR SCLEROSIS

HALL SEELY, M.D.

SAN FRANCISCO

My purpose in this report is to present the unusual anatomic manifestations of obliterating arteriolar sclerosis of the pulmonary vessels in the absence of significant sclerosis of the systemic vessels.

Atheromatous change in the pulmonary vessels occurs frequently in persons affected by a generalized arteriosclerosis. The presence of atheromatous plaques in the larger pulmonary vessels without marked systemic arteriosclerosis likewise is fairly common. However, such pathologic change can scarcely be considered significant. Almost invariably when pulmonary arteriosclerosis is capable of causing symptoms, it exists as arteriolar sclerosis, and it may be assumed that the significant vascular lesions referred to by writers describing the disabilities of patients involve the arterioles. In a series of more than 3,800 autopsies at the New Haven Hospital, the present case is the only one of its kind. The infrequency of the anatomic picture is attested by MacCallum<sup>1</sup> in a report of a similar case, the only one in a series of 12,000 autopsies at Johns Hopkins Hospital.

Pulmonary arteriosclerosis has had a tradition in the Argentine school of medicine since the clinical lecture in 1901 of Dr. Abel Ayerza, professor of medicine in the National University of Buenos Aires. He described a case of cardiac failure showing such a degree of cyanosis as to suggest the term "cardiac negro." Since then the term "Ayerza's disease" has been employed by many authors. The development of the theme has been carried out chiefly by the Argentine school and especially by two of Ayerza's pupils, Arrillaga<sup>2</sup> and Escudero.<sup>3</sup> A review of the French and South American literature on this subject makes clear the controversial nature of this rather nationalized nomenclature and explains the confusion attending the definition of the term "Ayerza's disease." To most people it means cardiac failure associated with pulmonary arteriosclerosis and with the absence of any significant systemic vascular changes.

As a matter of fact, in the autopsy of Ayerza's patient the pulmonary vessels were not remarkable but

dilatation of the bronchi, peribronchitis and hypertrophy and dilatation of the right side of the heart were described. Escudero in 1905 found a case that showed similar symptoms and signs and marked pulmonary atherosclerosis. In 1908 Rogers<sup>4</sup> reported ten cases of primary sclerosis of the pulmonary vessels and concluded that syphilis was a likely cause. In 1909 C. A. Marty first used the term Ayerza's disease in a published document. Since then there has been considerable dissension between Ayerza's two most interested pupils, Arrillaga and Escudero. The former has come to the view that Ayerza's disease is primarily a syphilitic pulmonary arteritis, often complicated by mitral stenosis or chronic bronchitis. Escudero considers Ayerza's disease to mean a syphilitic bronchitis in which chronicity is associated with a secondary arteriosclerosis attendant on general loss of elasticity and fibrosis of the lung. He divides the typical case into two phases, (1) the "bronchial period," in which the signs are bronchial, often mild, and accompanied by a moderate polycythemia, and (2) a cardiac phase, itself further divided into two parts, a period of compensation and one of decompensation in which the aspect of the black cardiac finally arrives. Congenital but not acquired syphilis, according to Escudero, is able to effect this picture.

Warthin<sup>5</sup> believed that Ayerza's disease was due to syphilis and presented a case in 1917 in which *Spirochaeta pallida* was demonstrated in the walls of the sclerosed pulmonary vessels. Clinically, however, the resemblance to the case described by Ayerza was slight. Naturally, the frequent presence in the lung of spirochetes other than *Spirochaeta pallida* removes the importance of such demonstrations.

There is a considerable body of French literature on the subject. Most French authors feel that the sclerosis in the pulmonary vessels is secondary to long-standing chronic bronchitis and emphysema. The conclusions of French writers are well summed up by Legrand.<sup>6</sup> He states that the "black cardiac" refers to a syndrome of progressive obliteration of the pulmonary artery and its branches and that it varies in cause in different cases.

In sifting the matter down, one must come to the conclusion that the term "Ayerza's disease" rests on an insecure footing. In spite of the descriptive quality of the term "black cardiac," chronic cyanosis is hardly limited to cases of sclerosis of the pulmonary vessels. The name "Ayerza's disease" is exceedingly dear to the Argentine school, but it would seem more logical to label cases showing obliterating sclerosis of the pulmonary arterioles without evidence of systemic sclerosis and without evidence of significant antecedent pulmonary disease as "primary obliterative pulmonary arteriolar sclerosis."

To be classified as such, a case should display at the most only insignificant systemic atherosclerosis and no hypertrophy of the left side of the heart. Mild emphysema, slight collections of small round cells and slight fibrosis of the bronchial walls must be expected as

1 MacCallum W. G. Obliterative Pulmonary Arteriosclerosis. Bull. Johns Hopkins Hosp. 49: 37-48 (July) 1911.  
2 Arrillaga F. C. Monograph on Cardiac Negros. Buenos Aires 1912.  
3 Escudero Pedro. Les cardiaques noirs et la maladie de Ayerza. Arch. d. mal. du cœur 19: 439 1926.  
4 Rogers Leonard. Extensive Atheroma and Dilatation of the Pulmonary Arteries Without Marked Vascular Lesions. A Not Very Rare Cause of Fetal Cardiac Disease in Bengal. Quart. J. Med. 2: 117 1908.  
5 Warthin A. S. Am. J. Syph. 1: 693 (Oct.) 1917. Contribution to Medical and Biological Research 1042 1919. A Case of Ayerza's Disease. Chronic Cyanosis, Dyspnea and Erythema. A Case of Syphilitic Arteriosclerosis of the Pulmonary Arteries. Tr. A. Am. 11: 247 1919. Bull. N. J. D. Wilson L. N. Harvey I. M. C. 1919.  
6 Legrand R. Black Cardiac Disease. Echo méd. du 22 1923.  
293 (Feb. 24) 1923.

From the Department of Pathology Yale University School of Medicine.

1 MacCallum W. G. Obliterative Pulmonary Arteriosclerosis. Bull. Johns Hopkins Hosp. 49: 37-48 (July) 1911.

2 Arrillaga F. C. Monograph on Cardiac Negros. Buenos Aires 1912.

3 Escudero Pedro. Les cardiaques noirs et la maladie de Ayerza. Arch. d. mal. du cœur 19: 439 1926.



secondary to the vascular change. After the full course of the disease with attendant cardiac failure complicated by terminal focal pneumonia, the primary nature of the arteriolar sclerosis may be masked and it is doubtful whether syphilis can be demonstrated as the cause. Cases of secondary pulmonary arteriosclerosis are less infrequent and more often than otherwise are secondary to long-standing chronic infection of the bronchial tree.

The symptoms and signs coincident with gradual obliteration of the pulmonary vessels follow a perfectly logical sequence and have been described. The inability of the alveoli to aerate sufficient quantities of blood per time unit leads to compensatory emphysema and polycythemia. The increase of pulmonary vascular resistance leads to the eccentric hypertrophy of the right heart. Cyanosis is naturally marked and continuous. The usual signs of cardiac failure appear when the myocardium is pushed beyond its reserve.

The case to be presented fulfils the requirements suggested for the category of primary obliterative pulmonary arteriolar sclerosis.

#### REPORT OF CASE

*History*—A white woman, aged 68, American, a housewife, entered the New Haven Hospital Aug. 19, 1935, complaining of cough, shortness of breath and swelling of the legs of a month's duration. Her family history was irrelevant. No history of respiratory or vascular disease was elicited. No record of exposure to dusty environment was obtained. The patient felt well until a month before entry when she became aware of the gradual onset of dyspnea and cough. This was soon followed by swelling of the legs. These symptoms were progressive in severity. Fatigue became prominent. She became orthopneic and was troubled by vague indigestion and gaseous distention. Her weight increased from 118 to 132 pounds (from 53.5 to 60 Kg.) despite her poor appetite. The swelling of her legs ascended over the abdominal wall. She was treated by her family physician with digitalis, with some relief of dyspnea. The patient did not have the advantage of rest during her illness and continued to carry out her rather strenuous household duties.

*Examination*—The patient's general appearance did not suggest acute illness. The temperature was 99.8 F., the pulse 100 and the respiratory rate 26. The blood pressure was 160 systolic, 110 diastolic. She appeared orthopneic and markedly cyanotic. The neck veins were distended. The heart was thought to be enlarged to the left. At the apex a loud rough murmur extended through systole. The sounds at the base were faint with a distinct gallop rhythm and occasional dropped beats. The electrocardiogram indicated interventricular block and right ventricular preponderance. The lungs were clear save over both bases posteriorly, where resonance and fremitus were impaired and many moist rales were heard. Edema of the abdominal wall and extremities was present. Ascites was not made out. Beyond this, no unusual physical appearances were present.

*Treatment and Course*—The patient was placed in bed and given digitalis but fluid rapidly accumulated at the right base. Thoracentesis was considered but it was thought best to temporize for another twenty-four hours. However, early in the morning of the third day she grew restless then extremely weak and suddenly ceased breathing.

Her admission blood count disclosed a hemoglobin of 91 per cent (Tallqvist), a red cell count of 6,200,000 and a white count of 5,500. The differential white count revealed 78 per cent polymorphonuclears, 19 per cent lymphocytes, 2 per cent large monocytes and 1 per cent basophils. The smear was not remarkable. The Wassermann reaction was negative. Urinalysis recorded a cloudy yellow uncatheterized specimen with an acid reaction, a 2+ albumin and no sugar. The quantity was insufficient for specific gravity determination and the sediment contained from 30 to 40 white cells per high power field.

*Autopsy*—Only the essential facts will be given from the complete protocol. These concern the heart, lungs and vascular system.

The lungs were small and collapsed. Pleural adhesions were not present. The right pleural cavity contained 300 cc. of sero-sanguineous fluid and the left pleural cavity 150 cc. The pericardium was distended with clear straw-colored fluid. There were no pericardial adhesions. The transverse diameter of the heart was 13 cm. and the chest 21 cm. The pulmonary artery was opened in situ with the release of only fluid blood.

The heart weighed 390 Gm. The epicardium was shining and transparent. The subepicardial fat was not increased and through it coursed patent coronary vessels. When the heart was opened a marked eccentric hypertrophy and dilatation was found limited entirely to the right ventricle. The myocardium presented a homogeneous reddish brown cut surface without the presence of fibrous scars or fresh infarct. The endocardium was smooth, shining and transparent throughout. The columnar carneae of the right ventricle were flattened but well rounded in the left. The chordae tendineae were thin and delicate and attached beyond the free border to the lower surface of thin velamentous valve leaflets. The aortic and pulmonary cusps appeared intact and competent approximating in a neat line of closure. The right ventricle wall measured 9 mm. in thickness and the left 11 mm. The tricuspid, pulmonary, mitral and aortic valves measured respectively 11.5, 5, 8.5 and 7 cm. No inter-mortem thrombi were found. No developmental anomalies were present.

The right lung weighed 200 Gm. It was small and collapsed. A mottled pink and gray parenchyma shone through a uniformly smooth and transparent pleura. The lung was everywhere finely crepitant and no discrete areas of increased density were palpable. At the borders of the lobes were raised patches of emphysematous lobules. The cut surface showed a homogeneous, finely granular, mildly crepitant gray surface. No exudate exuded from the cut surface, which appeared curiously dry in spite of the pleural transudate. The vessels were markedly sclerosed and were studded with atheromatous plaques. The larger branches were somewhat dilated and strangely immovable, as though blocked by obstruction farther ahead in the arterioles. Smaller branches from 1 to 2 mm. in diameter stood out from the cut section in a stiff but relief. The bronchial branches were free from exudate or obstructive lesions. The bronchial mucosa was smooth and shining. No enlarged lymph nodes were present at the hilus. No unusual pigmentation was noted.

The left lung weighed 170 Gm. and was exactly similar to the right lung, as were its hilar structures.

The aorta, together with its larger branches, was an elastic even calibered vessel with a very few small atheromatous plaques on the otherwise perfectly smooth intima.

On microscopic examination of the heart the epicardium was thin. The myocardial fibers were well preserved and stained. The individual fibers of the right myocardium were visibly larger than those of the left. No replacement fibrosis was seen. No cellular leukocytic infiltrations were present. The coronary vessels displayed no significant sclerosis. The endocardium was thin and reactionless.

Sections of the lung revealed a uniformly thin pleura. There was a mixed emphysema and atelectasis. The alveolar walls were mildly thickened by fibrosis. The alveolar spaces were uniformly free of exudate save for rare small collections of lymphocytes and monocytes. Pigment was never present in unusual amount. The larger vessels presented atheromatous changes in the intima with moderate fibrosis of the media. In the arterioles the lumens were reduced in size by this change at times to complete occlusion. Lifting up and reduplication of the intimal layer and a dense fibrosis of the media were present. In some arterioles there was evidence of canalization of old well organized thrombi. There was, however, no inflammatory reaction anywhere, acute or chronic. The picture on the whole was reminiscent of renal arteriolar sclerosis.

Sections of the aorta revealed a slight thickening in the intima with some hyalinization. No granulation tissue was present in the media which for the most part supported unbroken elastic fibers. No perivascular leukocytic infiltrations

were found. It is to be emphasized that arteriolar changes such as described in the lung were found in no other tissue.

The anatomic diagnosis was written: Primary Primary obliterative pulmonary arteriolar sclerosis, hypertrophy and dilatation of right side of the heart, chronic passive congestion of viscera, anasarca with hydropicardium, hydrothorax (bilateral) and ascites, pulmonary atelectasis and emphysema. Subsidiary: Diverticulitis of sigmoid colon, cervical polyp, hallux valgus (bilateral), fetal adenoma of thyroid.

## REFRACTORY ANEMIA

### ANALYSIS OF ONE HUNDRED CASES

C. P. RHOADS, M.D.

AND

W. HALSEY BARKER, M.D.

NEW YORK

The recent development of a clearer understanding of pernicious anemia and of the conditions which are allied to it has made more prominent the anemic states which do not respond to adequate therapy with liver extract or with iron. These refractory anemias have been long recognized but have been classified loosely as severe secondary, aregenerative or aplastic anemia. Insufficient information has been available, however, to warrant any conclusions concerning the fundamental nature of the conditions. For this reason, a clinical and experimental study of refractory anemia has been made at the Hospital of the Rockefeller Institute. In the series, all those patients have been included who were referred to the institution with anemia of severe degree which did not respond to the usual therapeutic methods. In this way a suitable cross section of the problem as it presents itself to the practitioner was obtained.

The diagnosis of refractory anemia can be made only rarely on hematologic evidence alone. Anemia is moderate to most severe, slight macrocytosis is a feature and the shape of the red cells may deviate only slightly from the normal or may show the most profound alterations. Leukopenia is almost always present and may be mild or extreme, it is usually associated with granulopenia and with the presence of abnormal, so-called toxic polymorphonuclear cells. Thrombopenia is usually marked but may be absent. Refractory anemia may frequently be differentiated from other anemic states by the prominence of hemorrhagic phenomena and by a tendency to the development of necrotic lesions of the mucous membranes. Fever is frequent and may be a prominent feature.

The cases of refractory anemia may be divided into two general groups, those in which the anemia is associated with a recognized disease entity and is presumably secondary, and those in which it seems to occur independently. The secondary type is included because frequently it cannot be recognized from the hematologic data alone and hence it may be a serious problem in differential diagnosis. Of the forty patients with secondary refractory anemia ten had Hodgkin's disease involving the bone marrow, four had obscure malignant neoplasms, twelve had presumptive evidence of degenerative disease of the liver, one had tuberculosis of the bone marrow and thirteen had either lymphoid or myeloid aleukemic leukemia. In many instances con-

clusive evidence of the primary disease process was obtained only from the histologic study of sternal bone marrow removed at biopsy.

Sixty cases of apparently primary refractory anemia were studied and divided into four groups on the basis of the pathologic changes of the bone marrow as seen at biopsy, at autopsy or both. The four basic pathologic changes were sclerosis normal cell hyperplasia, immature cell hyperplasia and immature cell hypoplasia. Sclerosis of the marrow was present in three cases. In twelve, an active marrow with apparently normal maturation was present, and in eight of these the presence of a hemolytic process was confirmed by studies of urobilin output. Studies of pigment excretion were not made in the remaining four cases. Hyperplastic, cellular marrows, infiltrated densely with uniformly immature cells, were present in eighteen cases. The cells were so undifferentiated that their nature could not be determined absolutely. This condition has been described by Thompson, Richter and Edsall<sup>1</sup> and is considered by some observers to be aleukemic leukemia. The absence of a leukemic blood picture, of leukemic tumor and of leukemic infiltration of organs is the basis for considering the group to be an independent one. The remaining twenty-seven cases were marked by hypoplasia to almost total aplasia of the marrow structure. This group differed from the one with hyperplastic marrow only in cellularity since the predominant type is a similar primitive, immature cell. When considered physiologically the condition is the result of disturbance of cell destruction or cell maturation or of both factors. Considerable information is afforded by studies of pigment excretion as an index of cell destruction and of coproporphyrin-I excretion as a measure of marrow activity.

The etiology of refractory anemia is obscure, but certain suggestions deserve consideration. The basic lesion of the bone marrow in the types marked by decrease of cell production with a predominance of primitive cell elements is very like that seen in acute granulopenia, a condition in which an abnormal susceptibility to certain chemical compounds has been established as etiologic in certain instances. Some evidence is at hand which suggests that a similar process if continued sufficiently long may be operative in causing a disturbance of erythropoiesis as well as of myelopoiesis.

Analysis of sixty cases of primary refractory anemia gives a history of exposure to compounds which may be toxic to the hemopoietic system in twenty-seven cases, or 45 per cent. This number is considered to be significant in view of the limited knowledge of the various factors which give rise to drug hypersusceptibility.

No suggestive toxic agent could be established for the group with sclerotic marrow. Two patients with hemolytic anemia and hyperplastic, normal cell marrow had been exposed to benzene and two had been given arsphenamine. One patient with active marrow for whom no pigment studies are available was proved to be sensitive to aminopyrine. Of the patients with hyperplastic immature cell marrow, two had radium poisoning, two had used aminopyrine, one was exposed to a number of potentially toxic solvents in his work as a roofer, two had been exposed to benzene, two had used a potentially toxic hair dye for many years and one had used cresote medicinally. Of the patients with

From the Hospital of the Rockefeller Institute for Medical Research.  
Read before the Section on Practice of Medicine at the Eighty-Eighth  
Annual Session of the American Medical Association, Atlantic City, N. J.,  
June 11, 1937.

<sup>1</sup> Thompson, W. P., Richter, M. A., and Edsall, H. S. *Am. J. M. Sc.* 187: 77 (Jan.) 1934.

hypoplastic immature cell marrow, four had been exposed to benzene two to arsphenamine, one to cinchophen, two to aminopyrine, one to acetophenetidin, one to hydroquinone one to possibly toxic solvents in his work as a printer two to excessive amounts of a naphthene-containing insecticide one to creosote and one to a potentially toxic hair dye. It should be emphasized that in most instances the exposure to possibly toxic chemicals was no greater than most persons can tolerate without difficulty.

The outcome of refractory anemia is not necessarily fatal, although it may well be so. For secondary anemia the prognosis is that of the primary disease. Of the sixty patients with primary anemia, seventeen had a well defined remission at some time. Of the seventeen remissions, fourteen were complete and three were only partial. Of all the remissions, six continued as long as the patients were observed, but in the remainder of the patients the disease recurred and terminated fatally.

Any discussion of the therapy of refractory anemia must be largely negative. Stomach preparations, whole liver and liver extract given in maximum dosage by both oral and parenteral routes have uniformly failed. No iron preparation has had any effect. Vitamin C has failed not only to alter the course of the disease but also to control the hemorrhagic phenomena. Transfusion has never had more than a transient effect on the course of the disease but may carry the patient along until the marrow function has recovered spontaneously. Some evidence is at hand that, for carefully selected patients with ample functioning bone marrow, an elevated reticulocyte level and evidence of definitely increased hemolysis, splenectomy may be a useful procedure. The nucleic acid derivatives have been uniformly without effect.

#### SUMMARY AND CONCLUSIONS

Analysis of 100 cases of refractory anemia proves the existence of two major groups those of primary and those of secondary anemia, in which the condition cannot always be differentiated on hematologic evidence. The cases of primary anemia may be subdivided on pathologic grounds into four groups based on the presence of sclerotic, normally hyperplastic immature hyperplastic or immature hypoplastic marrow. The physiologic mechanism is a disturbance of cell production or of cell destruction or both. When cell production is interfered with, the basic lesion is a predominance of primitive cell elements. In 45 per cent of the cases of primary anemia, a history of exposure to chemical compounds which may be hematologically toxic was present. Temporary remissions occurred in 25 per cent and permanent remissions in 6 per cent. No treatment was effective.

Sixty Sixth Street and York Avenue

#### ABSTRACT OF DISCUSSION

DR. GEORGE R. MINOT, Boston. The fact that the authors have been enabled to study during the last few years a hundred cases of relatively rare conditions leading to anemia, of a type for which no significant treatment exists, illustrates the value of institutions for clinical investigation. Their excellent work has been dependent on their diligence and on the foresight of individuals to place at their disposal the means for good work. It is also dependent on the cooperation of physicians and the patients themselves for they have given him the opportunity to study cases. Drs. Rhoads and Barker have emphasized the importance of realizing that these patients often have a micro-

cytic blood picture which is easy to confuse with that of pernicious anemia. The red cells do not vary as much in size as they usually do in pernicious anemia for a given red cell level. The cases tend to be diagnosed as pernicious anemia which has not responded to liver therapy. There is no evidence that the condition is due to an inability to use liver extract. Unlike pernicious anemia, the occurrence of a sore tongue is at least rare and achlorhydria is often not present. The patients are much less apt than those with pernicious anemia to be blue-eyed and to have premature gray hair. The classic type of aplastic anemia, in which the marrow is like butter, which usually occurs in young women and runs a rapidly fatal course over two or three months, is distinctly rare. It is more common now to recognize the cases of long duration, of a year at least and often, as Dr. Rhoads has pointed out, of several years duration. Some such patients have been kept alive by means of more than a hundred blood transfusions. In such cases, rarely large doses of liver extract cause a relatively slight reticulocyte response and increase of red cells, which usually do not occur again with repetition of liver therapy as anemia increases. As to some of the secondary types Hodgkin's disease of the bone marrow is occasionally seen with pronounced increases of reticulocytes and sometimes there is slight increased fragility of the red cells to hypotonic salt solution. One theoretically ought to be able to tell the secondary types. One may do so in many instances, but unfortunately too often a precise diagnosis cannot be made until biopsy or autopsy. A confusing situation is as follows: Rarely a patient who has undoubted leukemia with a classic blood picture has some weeks before death leukopenia with rapid progression of anemia and at autopsy the bone marrow is fatty and the pathologist is unable to find definite evidence of leukemia. A comparable condition may occur in the hemolytic anemia arising from trinitrotoluene poisoning. Usually in such cases the marrow is actively regenerating, but rarely the cases may terminate with a fatty marrow.

DR. RANDOLPH WEST, New York. In dealing with bone marrow, which is a complex organ with many cell types, there tends to be a certain amount of added difficulty because of the complexity of histologic structure. If one thinks of bone marrow as a simple tissue, as one might think of an ordinary gland, and then considers the possible types of response to a given injury, I think that many of the aplastic anemias will fall into a grouping that may be profitable to think about. If a destructive agent is present in the blood in sufficient concentration, there may be complete obliteration of the marrow, with a resulting fatty marrow which was the one described by all the earlier workers in aplastic anemia. If the agent is present in smaller amounts it is possible that repair may take place after the agent has ceased to act, and the pattern of repair may lead to practically normal regeneration of functionally adequate marrow. If the pattern of repair is somewhat different for reasons that are not yet understood, there may be the analogue of what in a glandular structure would be called an adenoma, in other words, the appearance of large amounts of anatomically fairly good looking but functionally imperfect tissue. It seems to me that the aplastic anemias with hyperplastic bone marrow may well fall into this group. One step beyond that. The type of regeneration may not be the analogue of a benign adenoma but may approach the type of true malignant disease. In this group probably fall aleukemic leukemias and the true leukemias. I think that while therapeutic measures applied after the pattern of a cell regeneration has been determined by various unknown factors in the body give little hope of successful therapeutic results the application of these measures during the earliest stages of regeneration after injury may well determine the pattern of regeneration. Certainly in the early benzene poisoning cases and also in the early aplastic anemias, one gets the clinical impression that a very adequate food supply to the bone marrow, chiefly liver extract and iron, may be of use in certain instances.

DR. HYMAN I. GOLDSTEIN, Camden, N. J. In Vienna I spoke to Prof. Julius Bauer concerning anemias that failed to respond to the ordinary liver preparations and asked whether he had tried intra-osseal injections of highly concentrated liver extract through a trephine puncture or trephine as suggested

originally by Arnold Josefson of Stockholm, who gave liver extract intrasternally and treated about twenty-five patients with this method (1930-1934). On the advice of Julius Bauer I have used a highly concentrated liver extract in a few instances. In some resistant cases of the types of anemia mentioned by the authors highly concentrated preparations, with the joint use, perhaps, of large doses of iron and spleen extract (by injections and orally), with or without blood transfusions, may give better results. Also, in cases of pernicious anemia in which there is allergy to liver or complicating arthritis perhaps the use of carefully prepared spleen and brain and kidney tissue extract with large doses of iron and blood transfusions may be helpful and life saving. William Schlesinger of Vienna informed me of his experience with concentrated spleen extract, in such cases. Spleen extract of high concentration and almost free of foreign protein material, by injections, is helpful in relieving itching skin conditions and weeping eczemas, which may at times occur as complications of severe anemias, jaundice, leukemias and Hodgkin's disease.

Dr. C. P. Rhoads, New York. Dr. Minot called our attention to something we had left out of the talk which we had planned. Symptomatically it is quite true that one can make a good clinical guess that one is dealing with a case of refractory anemia. It is not universal, glossitis of marked degree is rare, and neurologic disturbance is exceedingly uncommon, if not absent. Unfortunately, there were in the group examples in which there was glossitis. Of course, stomatitis is very common and very severe. There were just enough who had confusing symptoms in the central nervous system so that I, at least, cannot be perfectly certain until I have given therapeutic tests of liver extract. Splenectomy is a difficult question. We find it is rather entered into hastily in this type of case. We do believe that a very small group exists in which there is relatively good activity of the marrow, rather good maturation of cells in the marrow. We have endeavored to pick out cases in which splenectomy might be a life saving procedure. We have seen only three such cases, and we have removed the spleen in quite a number of other cases simply on the chance that we might pull some one out of a very bad situation. I think the operation can be used. I think it must be used with the greatest care and with every diagnostic aid employed before such a radical procedure is entered on. As to the question of disease of the bone marrow, of course that is a very moot point. I think it requires great experience to evaluate properly the histologic picture of the bone marrow. We have been deceived, and are still being deceived. It will tell, however, whether one has encountered an obscure case of pernicious anemia. I think it is a useful procedure both from the diagnostic point of view and from the point of view of classification and of understanding this difficult and distinctly obscure group of conditions.

**Sympathin and Parasympathin**—The mode of response of autonomic nerve stimulation is correlated with the properties of the chemical mediator liberated as a result of such stimulation. The chemical mediator commonly liberated by sympathetic stimulation possesses properties of adrenin and has been called sympathin, the one commonly liberated by parasympathetic stimulation possesses properties of acetylcholine and has been called parasympathin. Fibers whose stimulation results in the liberation of an adrenin-like mediator consequently may be called adrenergic, and those whose stimulation results in the liberation of an acetylcholine-like mediator, cholinergic. The fibers of sympathetic and parasympathetic origin are not mutually exclusive with regard to the chemical mediators. For example, stimulation of the sympathetic fibers which mediate constriction of the peripheral blood vessels results in the liberation of sympathin, while stimulation of those which mediate dilatation of the peripheral blood vessels results in the liberation of a chemical mediator with the properties of parasympathin. The responses elicited by stimulation of the latter fibers obviously belong to the same category as those elicited by stimulation of parasympathetic nerves.—Kuntz, Albert. *Relation of Autonomic Nervous System to Physical Therapy*, *Arch. Phys. Therapy* 19:24 (Jan.) 1938.

## PHENOLPHTHALEIN STUDIES

### ELIMINATION OF PHENOLPHTHALEIN

BERNARD FANTUS, M.D.

J. M. DYNIEWICZ, Ph.D.

CHICAGO

The discoverer of the cathartic action of phenolphthalein, Zoltan von Vamosy,<sup>1</sup> determined that more than 85 per cent of ingested phenolphthalein is eliminated in the dog's feces and that merely a minimal quantity of free phenolphthalein is occasionally to be found in the urine on the addition of alkali. He also noted in dogs, after the giving of enormous doses, an increase in the conjugated sulfates in the urine.<sup>2</sup>

Kastle probably was the first to discover the presence of conjugated phenolphthalein in the urine. After giving a dose of 0.5 Gm. of phenolphthalein intraperitoneally to a guinea pig he observed the excretion of conjugated phenolphthalein in the urine for twenty days.

Fleig<sup>3</sup> studied exhaustively the fate of phenolphthalein in the system, and he as well as others concluded that phenolphthalein is so stable a compound that it is not decomposed into phenol and phthalic acid in the

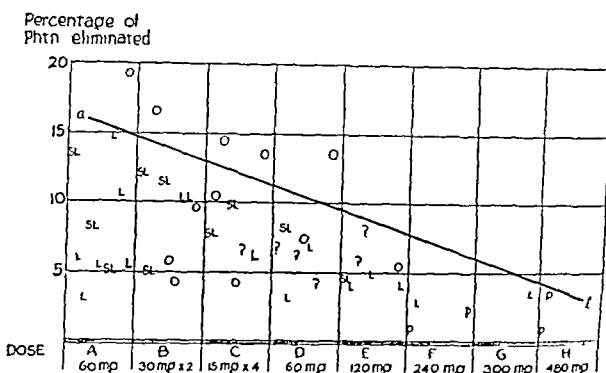


Chart 1—Elimination of phenolphthalein in relation to dose and to cathartic action. The line a indicates that the larger the dose the smaller the percentage of phenolphthalein eliminated obviously because the greater the cathartic action the less the percentage of phenolphthalein absorbed.

system. When given by mouth in large doses it passes in the free state into the urine, where it can be discovered by the addition of sodium hydroxide, it also causes an increase in the quantity of conjugated sulfates in the urine. This increase of the conjugated sulfates is particularly marked in animals that received injections of it under the skin or into the blood. A relatively small portion of conjugated glycuronate was also found in the urine of dogs after ingestion of large doses of phenolphthalein.

We have found in a previous study of urinary elimination following 1,000 medicinal doses of phenolphthalein<sup>4</sup> that, after small medicinal doses free phenolphthalein is usually absent from the urine and that the larger the dose the more frequently does free phenolphthalein appear in the urine. Conjugated

From the Laboratory of Pharmacology and Therapeutics, University of Illinois College of Medicine.

<sup>1</sup> von Vamosy, Zoltan. *Ueber ein neues Abführmittel* (Jürgen) Therapie der Gegenwart München med. Wchn. chr. May 1907.

<sup>2</sup> von Vamosy, Zoltan. *Ist Purgien ein chadisches Abführmittel?* München med. Wchn. chr. 50:1124 (June 30) 1903.

<sup>3</sup> Fleig, M. C. *Deux purgatifs synthétiques* Arch. int. 18:371 1903.

<sup>4</sup> Fantus, Bernard, and Dyniewicz, J. M. *Phenolphthalein: 1,000 Doses of Phenolphthalein. Urinary excretion* J. A. M. A. 105:443 (Feb. 6) 1937. *IV. Phenolphthalein Solubility* Am. J. D. 2:1 Nutrition 2:73-77 (Oct.) 1936.

phenolphthalein, on the other hand, is always present, so that testing for conjugated phenolphthalein may serve as a test that phenolphthalein has been ingested. The estimation of the quantity of free and of conjugated phenolphthalein in the urine may serve as a measure of the elimination of total phenolphthalein in the urine.

Since, in the previous study, we had the opportunity of assaying but a single twenty-four hour specimen of urine after a dose of phenolphthalein, which gave us the qualitative data recorded, it seemed desirable to make careful quantitative estimations of the total amount of phenolphthalein eliminated in the urine after a medicinal dose by continuing the determinations of the quantity contained in successive twenty-four hour specimens until it was no longer found in the urine. This may give a basis for the determination of abnormalities of elimination, as well as a means for the evaluation of methods of treatment after phenolphthalein overdosage.

#### METHOD OF STUDY

The urine specimens were obtained from volunteers, chiefly young medical students, who furnished a portion of the mixed twenty-four hour collection, preserved by xylene, and a statement of the total quantity of urine passed. This was continued on consecutive days after taking a specified dose of white phenolphthalein at bedtime until the urine was found free from phenolphthalein. The following doses were administered at intervals of a week and will be referred to for the sake of brevity under the letters given.

Dose A White phenolphthalein, 0.06 Gm in capsule, taken at bedtime.

Dose B White phenolphthalein 0.03 Gm in two capsules one at bedtime and one in the morning.

Dose C White phenolphthalein, 0.015 Gm in four capsules, one at bedtime, one in the morning, one four hours later, and one four hours after this.

Dose D White phenolphthalein, 0.06 Gm in capsule, taken at bedtime (as control for dose A).

Dose E White phenolphthalein, 0.12 Gm in capsule taken at bedtime.

Dose F White phenolphthalein, 0.24 Gm in capsule, taken at bedtime.

Dose G White phenolphthalein, 0.30 Gm in capsule taken at bedtime.

Dose H White phenolphthalein, 0.48 Gm in capsule, taken at bedtime.

The analyses were conducted as follows:

**Method of Determining Conjugated Phenolphthalein in Urine**—Heat 10 cc of urine and 10 cc of 10 per cent hydrochloric acid on a water bath for from three to four hours to break up the conjugation. Allow the solution to cool. Extract with ether in from 15 to 20 cc portions until a small volume of the last washing shows no trace of phenolphthalein when tested with sodium hydroxide volumetric solution.

The combined, filtered ether portions containing the freed phenolphthalein are shaken with a small portion of tenth normal sodium hydroxide volumetric solution and allowed to stand until the mixture has completely separated. The alkaline solution is then drawn off into a second separator and the process repeated until all the phenolphthalein is extracted. The combined alkaline solutions are then made acid with the smallest amount of hydrochloric acid and again extracted with ether.

The ether portions are made alkaline with tenth normal sodium hydroxide volumetric solution (the volume used depending on the amount of phenolphthalein present) and compared with the same volume of tenth

normal sodium hydroxide volumetric solution, to which is added a known standard phenolphthalein solution to color equality, and the amount of phenolphthalein present is calculated.

**Method of Determining Free Phenolphthalein in Urine**—Extract 10 cc of urine with ether in from 15 to 20 cc portions until a small volume of the last washing shows no trace of phenolphthalein when tested with

#### Report of Cases

Dose		Laxative Action*	Conjugated Phenolphthalein Eliminated	Percentage of Dose	Free Phenolphthalein Eliminated	Percentage of Dose
Case 1 R F						
A	60 mg	SL	83 mg	138	0	0
B	30 mg	SL	74 mg	124	0	0
C	15 mg	SL	431 mg	80	0	0
D	60 mg	O	401 mg	67	0.27 mg	0.45
E	120 mg	SL	575 mg	48	0	0
F	240 mg	P	28 mg	116	0.1 mg	0.04
H	480 mg	P	49 mg	102	1.00 mg	0.21
Case 2 M H						
A	60 mg	L	36 mg	61	0.15 mg	0.216
B	30 mg	SL	385 mg	513	0	0
C	15 mg	O	662 mg	113	0.120 mg	0.17
D	60 mg	SL	52 mg	861	0.10 mg	0.175
E	120 mg	L	553 mg	46	0	0
F	240 mg	L	768 mg	290	0.1 mg	0.22
H	480 mg	P	133 mg	32	2.32 mg	0.483
Case 3 F F						
A	60 mg	L	206 mg	343	0.15 mg	0.3
B	30 mg	O	100 mg	166	0	0
C	15 mg	O	88 mg	146	0.06 mg	0.49
D	60 mg	L	202 mg	336	0	0
E	120 mg (a)	?	644 mg	536	1.24 mg	1.06
F	60 mg (b)	?	410 mg	394	0.94 mg	0.823
Case 4 I I						
A	60 mg	SL	49 mg	811	0.19 mg	0.31
B	0 mg	SL	600 mg	116	0	0
C	15 mg	SL	9 mg	9	0	0
D	60 mg	?	39 mg	66	0.086 mg	0.14
E	120 mg	?	493 mg	410	0.12 mg	0.1
Case 5 F S						
A	60 mg	I	44 mg	56	0	0
B	30 mg	O	366 mg	601	0.078 mg	0.16
C	15 mg	O	262 mg	437	0	0
D	60 mg	O	46 mg	766	0	0
E	120 mg	L	599 mg	499	0	0
Case 6 J S						
A	60 mg	SL	326 mg	54	0	0
B	30 mg	O	260 mg	430	0	0
C	15 mg	?	421 mg	701	0	0
D	60 mg	L	424 mg	70	0	0
Case 7 C M						
A	60 mg	L	904 mg	151	0	0
B	30 mg	L	979 mg	163	0	0
C	15 mg	I	98 mg	64	0	0
D	60 mg	?	28 mg	467	0	0
Case 8 R L						
A	60 mg	I (d day)	625 mg	1047	0.12 mg	0.21
B	30 mg	I (d day)	6217 mg	103	0.225 mg	0.37
Case 9 W T						
A	60 mg	O	11703 mg	197	0.12 mg	0.205
B	30 mg	O	900 mg	98	0	0
C	15 mg	O	876 mg	139	0	0
D	60 mg	O	87 mg	18	0	0
F	120 mg	O	677 mg	56	0	0
H	60 mg	L	1001 mg	20	1.2 mg	0.117
Case 10 C M						
A	60 mg	I	2 mg	416	0.784 mg	1.3
F	120 mg	I	436 mg	38	0.41 mg	0.17
F	240 mg	P	43 mg	31	0.45 mg	0.20

The symbols used here and in chart 1 are as follows: O indicates no cathartic action; ? no report; SL slight laxative action; L laxative action; oft tool P purgative action—liquid stool.

tenth normal sodium hydroxide volumetric solution. The combined, filtered ether portions containing the phenolphthalein are shaken with tenth normal sodium hydroxide volumetric solution, the volume used depending on the amount of phenolphthalein present. It is advisable to make the extraction with as few separations as possible and to make the reading quickly, because phenolphthalein in alkaline solution tends to decolorize. This solution is compared with the same volume of tenth normal sodium hydroxide volumetric solution to which

is added a known standard phenolphthalein solution to color equality, and the amount calculated

We are able to report on the results secured as to total elimination after the taking of fifty-five doses by ten different volunteers who were thoroughly cooperative, as shown in the accompanying table. We

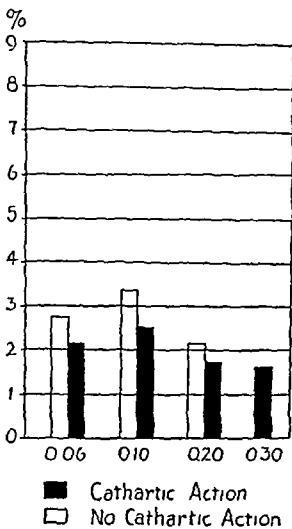


Chart 2—Average percentage of the dose of phenolphthalein eliminated in the first twenty-four hour urine specimen in the form of conjugated phenolphthalein. The greater the cathartic action the less the urinary elimination of phenolphthalein.

phenolphthalein eliminated as compared with the amount ingested, when the results as to degree of evacuant action are considered. It is an interesting fact, as shown by

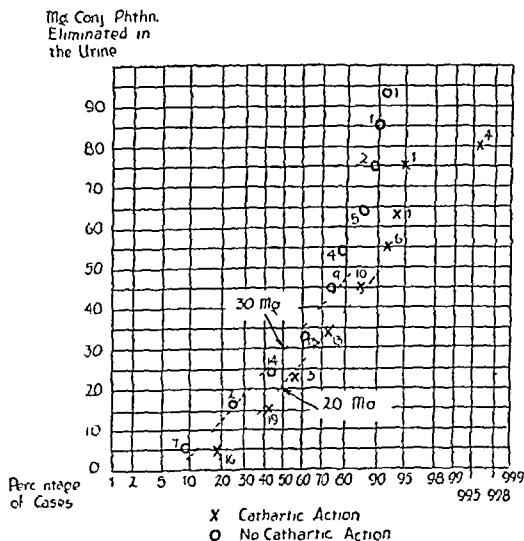


Chart 3—Phenolphthalein conjugate elimination is influenced by cathartic effect dose being constant (0.20 Gm). Cathartic effect decreases the amount of conjugated phenolphthalein elimination. On arithmetic probability paper the milligrams of conjugated phenolphthalein in the first twenty-four hours are placed in the abscissa while the ordinates indicate the total percentage of cases so that the 50 per cent line indicates the probability that there will be an approximately equal number of cases to either side of it. The actual number of determinations is indicated by the figures accompanying the respective points in the graph.

this graph that the presence or absence of cathartic action has a definite determining influence on the urinary elimination of phenolphthalein. There is a tendency—other things being equal—to an inverse rela-

also have results of the single twenty-four hour elimination after 1,000 doses of phenolphthalein. It seems that this can best be done in the form of graphs.

#### INFLUENCES DETERMINING THE ELIMINATION OF PHENOLPHTHALEIN

Attention was concentrated on the following factors as to their influence on the total amount of phenolphthalein (free and conjugated) eliminated: (1) cathartic action and size of the dose, (2) the method of its administration, and (3) the elimination on successive days after the dose.

#### 1. Relation of Conjugated Phenolphthalein Elimination to Cathartic Action—

This relation is shown in chart 1, in which symbols indicate the percentage of

phenolphthalein eliminated as compared with the amount ingested, when the results as to degree of evacuant action are considered. It is an interesting fact, as shown by

tion between the two, i. e. the greater the cathartic action, the less the urinary elimination of phenolphthalein and vice versa. This relation is also shown to be true for phenolphthalein in chart 2, which gives the results of the twenty-four hour elimination after 1,000 doses of phenolphthalein in our previous study, as well as by the "probability curve" of chart 3 based on this study. As shown in chart 3, the 50 per cent ordinate of the cases with cathartic action intersects the abscissas at 2 mg and that of the cases with no cathartic action at 3 mg. It is obvious when one scrutinizes chart 1 that the amount eliminated bears no proportion to the dose administered; that indeed, generally, the larger the dose the smaller a percentage of it is eliminated. This may seem paradoxical if it is not remembered that the greater the dose the greater the cathartic effect, hence the greater amount is lost in the stools and the lesser remains for elimination in the urine.

2. Broken Dose Administration—The suggestion has been advanced to administer this rather insoluble cathartic in "broken dosage," similarly to the way in which calomel is so frequently given, with the hope of securing a more pronounced cathartic effect by better utilization of the solvent available. Such a result is by no means obtained in the case of phenolphthalein. The first four doses administered in this study amounted to 60 mg, each given at intervals of a week, the first dose (A) and the fourth dose (D) were each given in one capsule at bedtime, while the second dose (B) was given in two 30 mg capsules, one taken at bedtime and one in the morning, the third dose (C) in four 15 mg capsules, one taken at bedtime, one the first thing in the morning and then one at intervals of four hours until the entire dose was consumed. We found that, in some instances broken dosage resulted in diminution or absence of cathartic action and in a greater urinary elimination of phenolphthalein (see report of cases).

3. The Phenolphthalein Elimination Curve—When the twenty-four hour phenolphthalein elimination in the urine is plotted after several doses, a curve is secured the composite of which for all the cases on the 60 mg dose is shown in chart 4. It will be seen from this that while the curves vary in detail they agree among themselves in that with the majority of cases the peak of elimination is reached in the urine the second twenty-four hours and that in most instances it ends in the fourth twenty-four hour specimen. We find that this is true apparently irrespective of dose and the manner of its administration. There was an exceptional individual in whom the elimination continued up to the sixth or even the eighth day. In such a case no cathartic action was secured from any of these doses.

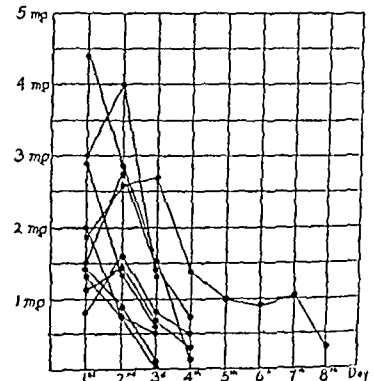


Chart 4—Conjugated phenolphthalein elimination curves after 60 mg dose of phenolphthalein. The peak of elimination is reached in the second twenty-four hours and elimination ends with the fourth twenty-four hour specimen. It may continue longer when there is no cathartic action as shown by the case in which the elimination lasted to the eighth day.

# CONCLUSIONS

- 1 In the urine, free phenolphthalein is generally absent or is present merely in traces after the usual medicinal doses, but it seems to be constantly present after large medicinal doses, i. e., doses above 240 mg, when the total elimination of free phenolphthalein may reach from 1 to 2 mg in twenty-four hours
- 2 Conjugated phenolphthalein is always present in the urine of persons taking phenolphthalein
- 3 The total quantity of phenolphthalein eliminated (both free and conjugated) varies from 202 to 1767 mg after the giving of doses of from 60 to 480 mg
- 4 The percentage of phenolphthalein eliminated of the quantity ingested varies from 141 to 197
- 5 The larger the dose the smaller is the relative percentage of phenolphthalein eliminated, probably because the greater the cathartic action the less is the absorption
- 6 The peak of elimination is reached on the first day in 44 per cent of the cases and on the second day in 52 per cent of the cases, a third day peak occurs in only 4 per cent of the cases and never beyond this time. In other words, it is reached practically in all cases within forty-eight hours after administration and it never exceeds seventy-eight hours. The duration of elimination does not, as a rule, exceed six days unless there is no cathartic action, when it may continue longer. Elimination usually ends by the fourth day, when there is cathartic action

## Clinical Notes, Suggestions and New Instruments

### LYMPHOGRANULOMA AS A CAUSE OF PELVIC INFLAMMATORY DISEASE

RIGNEY D'AUNOY, M.D. AND JOHN R. SCHENKEN, M.D.  
NEW ORLEANS

In a previous communication from these laboratories von Haam and D'Aunoy<sup>1</sup> reported that 33 per cent of females in a series suffering from venereal lymphogranuloma complained of pain in the lower lumbar and sacral regions, especially prominent when attempting to lie down. This symptom, which could be elicited in only 6 per cent of the males, they considered indicative of involvement of the deeper pelvic lymph glands, a common occurrence during the course of the infection in the female. In the same communication they suggested the possible etiologic significance of venereal lymphogranuloma in the production of chronic pelvic inflammatory disease, so frequently encountered in Negro women in this part of the country. Franchi<sup>2</sup> operated on a woman with venereal lymphogranuloma and acute pelvic symptoms in the left tubo-ovarian region he found an inflammatory mass bound by numerous adhesions to the rectum and sigmoid and containing pus from which a potent Frei type antigen was prepared. We recently encountered a case of apparent simple salpingitis nodosa in which the microscopic changes were so suggestive of venereal lymphogranuloma as to warrant recording even though unfortunately definite proof of the virus as the causal agent was not established.

#### REPORT OF CASE

**History.**—A Negroess aged 19 married, admitted to the Charity Hospital of Louisiana complained of moderately severe pain in the lower part of the abdomen of six weeks duration. The point of greatest intensity was in the right lower quadrant. The last menstrual period ended three weeks before

admission. She had been pregnant on two occasions, the first pregnancy terminating in the delivery of a stillborn full term infant, the second in the birth of a full term child which lived only ten hours. She had had no abortions.

**Examination.**—Physical examination revealed that the patient was well developed and well nourished and apparently not acutely ill. The temperature was 99 F, pulse rate 72, blood pressure 130 systolic, 80 diastolic. Except for the pelvic examination revealed no abnormalities. Marked tenderness was elicited in the right lower quadrant and bimanual examination revealed a small mass in this region as well as tenderness of both adnexa. The cervix showed numerous erosions.

Laboratory examinations revealed hemoglobin 80 per cent (Sahli), sedimentation time twenty-five minutes, blood Wassermann reaction negative, urinalysis negative.

**Course.**—During her stay in the hospital her highest temperature was 99 F, and under conservative treatment she



Fig. 1.—Section of a miliary abscess. Note the central area of necrosis surrounded by a zone of epithelioid cells with a dense peripheral infiltration of plasma cells and lymphocytes.

improved considerably, being discharged with the diagnosis of chronic cervicitis, chronic pelvic inflammatory disease and chronic appendicitis.

Three months later she was readmitted because of persistence of pain in the right lower quadrant of the abdomen. Physical examination was essentially the same as on the previous admission. Both adnexa were still tender and a right adnexal mass was palpable. Sedimentation time was fifty-five minutes but otherwise the laboratory results were unchanged. A bilateral salpingo-oophorectomy and appendectomy were performed under spinal anesthesia. Except for pelvic adhesions the peritoneal cavity appeared normal. The postoperative course was uneventful.

**Pathologic Examination.**—The specimen consisted of two fallopian tubes each of which measured 6 cm in length, two ovaries and an appendix. Both tubes showed increased tortuosity, firm, thickened walls, fibrous adhesions on their serosal and patent fimbriated ends, but the fimbriae were markedly thickened and blunt. The proximal portions were firm and nodular, measuring 1.5 cm in diameter. A small amount of purulent material could be expressed from the surfaces exposed by sectioning through the nodular areas. The ovaries appeared normal and the appendix, except for a few serosal adhesions, was normal. The gross impression was chronic salpingitis nodosa.

From the Departments of Pathology and Bacteriology of the Medical Center of Louisiana State University and the Charity Hospital of Louisiana.

<sup>1</sup> von Haam, Emmerich and D'Aunoy, Rigney. Is Lymphogranuloma Inguinale a Syticemic Disease? *Am J Trop Med* 16: 52, (Sept) 1936.

<sup>2</sup> Franchi, F. Su di un caso di parametrite causata dal virus della sordidezza inguinale. *Cioma Ital di dermat e si* 75: 2003 (Dec) 1934.



Sections taken through the nodular portions of the tubes showed many milary rounded and stellate abscesses in the walls of the organs. The largest of these measured approximately 0.25 cm in diameter. They were composed of central areas of liquefaction necrosis, containing polymorphonuclear leukocytes, scattered macrophages and necrotic unidentifiable cells and cellular debris. Surrounding these areas there were well formed zones of epithelioid cells in which an occasional irregular shaped, multinucleated giant cell was found. Beyond there were dense infiltrations of lymphocytes, macrophages, a few neutrophilic leukocytes and plasma cells, the latter predominating. In several instances a continuous tissue defect from an ulcerated area of the mucosa to a milary abscess could be noted, the submucosa and musculature being replaced by a sparsely vascular, atypical granulation tissue infiltrated with plasma cells and macrophages. Inflammatory cells diffusely infiltrated the nonabscessed musculature, the subserosal tissue, the mesosalpinx and the serosal adhesions. Both perivascular and paravascular cellular infiltrations were observed, the latter frequently occurring as rather large rounded collec-



Fig. 2—Section of the epithelioid cell zone with the pus cells and necrotic debris above and the peripheral lymphocytic infiltration below.

tions of lymphocytes. Many of the arteries in the wall of the tubes and in the mesosalpinx showed marked adventitial and subendothelial connective tissue proliferation, some of them with slight and others with marked inflammatory cell infiltration of their walls. The lumens of many were markedly reduced in size and a few were completely occluded by this process. Both tubes were patent but the papillations were reduced in numbers, the papillae remaining being enormously thickened and blunt because of marked submucosal plasma cell infiltration. Except in the ulcerated areas, the mucosa was intact but consisted of flattened or cuboidal nonciliated cells. Superficial inclusions of epithelium resulting in pseudo acinous formations were common. Sections stained by Grams, Ziehl-Neelsen's, Giemsa's and Wright's methods failed to reveal micro organisms.

#### COMMENT

Since the histologic picture was so suggestive of the typical suppurative lesions of the lymph glands encountered in venereal lymphogranuloma, Frei tests were made on the patient with two different antigens and both were strongly positive. The patient stated that she never had enlarged inguinal lymph glands. Careful examination failed to reveal inguinal buboes, rectal stricture or any significant lesion of the external genitalia.

#### SUMMARY

1 In a case of salpingitis with microscopic lesions consistent with those found in other organs during the course of venereal lymphogranuloma the patient was Frei positive and gave no other evidence of being or having been infected with the virus of venereal lymphogranuloma.

2 The case shows the necessity for considering venereal lymphogranuloma as an etiologic factor in pelvic inflammatory disease particularly in the Negro race.

#### GONOCOCCIC MENINGITIS

##### RESULTS OF TREATMENT WITH SULFANILAMIDE

H. P. MARVIN, M.D. AND W. E. WILKINSON, M.D. FORT BRAGG, N. C.  
Captain and First Lieutenant, Respectively, Medical Corps, U. S. Army

Gonococcic meningitis is a very rare clinical condition, considering the fact that we have been able to find only twenty-two cases reported in the medical literature. Most of these reports were in foreign medical journals. Strictly speaking, one should not consider gonococcic meningitis as a separate and distinct primary disease entity, since it developed in the presence of an active gonococcic infection elsewhere in the body in each of the twenty-two reported cases. This is also true of the case to be reported in this article. Therefore this condition should be considered as a complication of a gonococcic infection occurring primarily in some other organ or system of the body. It may originate by metastasis from a gonorrheal vaginitis, urethritis, prostatitis, seminal vesiculitis, arthritis, ophthalmitis or any combination of these conditions as well as of others.

It is believed that cases of gonococcic meningitis have been overlooked in the past, owing possibly to the mildness of the meningeal symptoms in occasional cases or to the fact that the meningitis was considered of meningococcic origin; the gonococcus and the meningococcus are so similar morphologically.

The first mention of nervous manifestations in cases of gonorrhea was made by Home<sup>1</sup> in 1805. Bradford and Kelley<sup>2</sup> and Strumia and Kohlhas<sup>3</sup> reported cases of gonococcic meningitis and reviewed the literature on this subject in 1933. Three of the cases reported in these reviews were in the newborn; two were in females and the remaining seventeen cases were in males between 19 and 60 years of age. There were ten deaths in the twenty-two cases, giving a mortality of approximately 45 per cent, showing that this disease or disease complication is a serious one as well as a very uncommon one. The rarity of this type of meningitis seems all the more remarkable, considering the prevalence of gonococcic infections. Blumer<sup>4</sup> only mentions of this condition as follows: "It is generally assumed that involvement of the nervous system is toxic rather than metastatic although such lesions as gonorrheal meningitis are undoubtedly due to metastasis."

We feel that the case we are presenting is of unusual interest in several respects, in addition to the fact that it presents a rare and serious complication of gonococcic infections. The patient was admitted to the hospital soon after the admission of two patients with meningococcic meningitis and was treated as such, including the administration of meningococcus antitoxin, during the first few days of hospitalization. This patient exhibited certain clinical and laboratory manifestations which were very much unlike those found in meningococcic meningitis and which led to additional bacteriologic studies. Moreover, the first Wassermann reaction of the spinal fluid was negative, whereas one taken two months later was positive. Sulfanilamide was used therapeutically after the organisms isolated from the spinal fluid were definitely identified as gonococci by means of careful morphologic, cultural, fermentation and agglutination studies, which are given in detail in a later paragraph.

From the Medical Service, Station Hospital, Fort Bragg, N. C.  
1 Home, Everard. Practical Observations on the Treatment of Strictures in the Urethra and in the Esophagus, ed. 3. London: W. Bulmer & Co., 1805, vol. 2, pp. 11, 211, 271 and 278.  
2 Bradford, W. J., and Kelly, H. W. Gonococcic Meningitis in a New Born Infant. *Am. J. Dis. Child.* 10: 543-549 (Sept.) 1933.  
3 Strumia, M. M., and Kohlhas, J. J. Gonococcic Meningitis. *J. Infect. Dis.* 5: 212-218 (Sept. Oct.) 1933.  
4 Blumer, George. In Cecil Text Book of Medicine, ed. 10. Philadelphia and London: W. B. Saunders Company, 1933, p. 137.

REPORT OF CASE

**History**—J W, a Negro youth aged 18, an enrollee in the Civilian Conservation Corps, was admitted to the genito urinary service of the hospital May 21, 1937, because of a profuse purulent urethral discharge of ten days' duration. The family history and the past history were irrelevant. The patient reported that his last sexual exposure was May 1. He did not take any type of prophylaxis. A kernel developed in the left groin May 15, and he noticed some burning on urination. There had been no treatment of any kind prior to admission. There were no other symptoms.

**Examination**—At the time of admission the patient was athenic, well developed, fairly well nourished and in no acute distress. He was 67 inches (170 cm) tall and weighed 115 pounds (52 Kg). The skin was dry. The tonsils were enlarged and chronically infected. The left inguinal glands were moderately enlarged, discrete and tender. The heart, lungs and abdomen were normal. The blood pressure was 108 systolic, 68 diastolic. Neurologic examination was negative. There was marked phimosis and a profuse purulent urethral discharge. The prostate and seminal vesicles were normal. There were no other physical abnormalities.

The blood count revealed red blood cells 3,900,000, hemoglobin 70 per cent, white blood cells 6,400, neutrophils 72 per cent, lymphocytes 23 per cent, monocytes 4 per cent, basophils 1 per cent. The first glass of urine was cloudy, the second and third glasses were clear. Specific gravity was 1.018. Tests for albumin and sugar were negative. On microscopic examination there were many white blood cells and many intracellular and extracellular gram-negative diplococci. A smear from the urethra showed many white blood cells as well as many intracellular and extracellular gram-negative diplococci. The blood Wassermann reaction was two plus, the Kahn reaction four plus. The Wassermann test was repeated later with the same results.

The clinical diagnosis was (1) urethritis acute anterior, gonorrheal, (2) phimosis, (3) tonsillitis, chronic, follicular, bilateral, (4) syphilis, tertiary, (5) anemia, secondary.

**Progress in the Hospital**—May 23 the patient was to receive local treatment for urethritis, but he was not feeling well and treatment was delayed.

May 24 (three days after admission) the patient complained of severe generalized headache, he became nauseated, vomited and stated that he could not walk because his back, neck and legs were stiff. Examination at this time revealed no mental changes. The temperature was 103.5 F, the pulse 64, respiratory rate 16 and blood pressure 130 systolic, 80 diastolic. The white cells count was 6,500, with 71 per cent polymorphonuclear leukocytes. The neck was rigid and hyperextended. The Kernig sign was strongly positive bilaterally. The Babinski reflex was absent. A lumbar puncture was performed and 7 cc of cloudy fluid spurted out. No more fluid could be obtained at this time. The pressure was not measured but was markedly increased. The cell count of the spinal fluid was 14,700. Globulin was four plus. A smear showed many intracellular and extracellular gram-negative diplococci. In spite of the many gram-negative intracellular diplococci, the patient was thought to have a meningococcal meningitis at that time and was transferred to the medical service, where therapy was instituted.

From May 24 to May 28 the patient received 110,000 units of meningococcus antitoxin intravenously as well as other symptomatic treatment without any change in his condition. The temperature varied from 100 to 102.4 F. Blood counts remained about the same as the one made May 24. The pulse varied from 70 to 98 respirations from 18 to 22. Cell counts of the spinal fluid varied from 14,700 to 13,700 and the fluid continued to be cloudy. Stiffness of the neck remained unchanged. The Kernig reflexes were positive and the patient was perfectly rational and mentally normal in every way. He complained only of slight generalized headaches which were partially relieved by daily spinal drainage of from 5 cc. to 12 cc of fluid since larger amounts could not be obtained. Cultures planted on 7.4 per cent blood agar showed no growth after seven days incubation at 37 C.

May 31, spinal puncture was performed with a spinal fluid cell count of 14,200. The complement fixation test for syphilis

(Wassermann) on this spinal fluid was negative in all four dilutions. Globulin was normal and the colloidal gold curve was normal. Smears were positive for intracellular and extracellular gram-negative diplococci. Culture of the spinal fluid showed no growth on blood agar slants or in broth. Culture on a poured blood agar plate with ascitic fluid and incubated in a carbon dioxide jar at 37 C for four days showed twelve small dew drop colonies which on smear, revealed gram-negative diplococci. A colony was transferred to tubes of sugars and produced acid in dextrose but did not produce acid in maltose or other sugars. Agglutination tests with polyvalent antimeningococcus serum were negative. Agglutination tests with serum from a patient who had just recovered from gonorrheal urethritis, epididymitis and seminal vesiculitis were positive. Control tests were negative. Blood sugar was 86.9 mg per hundred cubic centimeters. Nonprotein nitrogen was 26.7 mg per hundred cubic centimeters. Fundus examination was negative.

**Therapy with Sulfanilamide**—Realizing that gonococcal meningitis is a rare condition, that the mortality is high and that no specific treatment is known, we started the patient on small doses (0.324 Gm) of sulfanilamide three times a day commencing June 1. The temperature became normal and remained so all day for the first time June 12. It was normal on the 13th and 14th, so the sulfanilamide was discontinued at that time.

June 16 to June 30 the daily temperature fluctuations ranged from 98.6 to 102.6 F.

June 21, sulfanilamide 0.324 Gm three times a day was again instituted because of fever. The spinal fluid cell count was 8 having gradually dropped since May 28, at which time the count was 14,000.

June 26, stiffness of the neck was absent for the first time.

June 30 the temperature was normal. Sulfanilamide was discontinued. There was no stiffness of the neck.

June 30 to July 22 the temperature was normal. There were no symptoms or abnormal physical signs.

July 28 four Wassermann reactions of the spinal fluid were two plus, two plus, plus minus, negative. The cell count was 42. Globulin was two plus. The colloidal gold curve was 5555-421100. Additional diagnosis: Syphilis, cerebrospinal (added).

July 22 to August 3 the temperature fluctuated from 98 to 101.8 F.

August 3 to August 12 the temperature fluctuated from 98 to 99.6 F.

August 12 to August 14 sulfanilamide 1.3 Gm was given three times a day. The temperature was normal.

August 14 to August 18, sulfanilamide 0.65 Gm was given three times a day. The temperature was normal.

The patient's temperature remained normal, the spinal fluid was free from organisms, and the patient exhibited no subjective symptoms or abnormal objective manifestations of any kind. He was considered cured of gonococcal urethritis and meningitis and started on antisyphilitic therapy. August 28 he was discharged from the hospital and will continue the antisyphilitic therapy at home.

COMMENT

This case of gonococcal meningitis has been very instructive, although we do not wish to draw too definite conclusions from one case. It has suggested several interesting features which, in addition to the facts brought out in the literature by the previously reported cases, are worthy of consideration. In contrast to most cases of meningococcal meningitis the disease in this case ran a prolonged course of several weeks instead of several days. The pulse was moderately slow (from 64 to 98). The white blood counts remained within normal limits. Very little (from 7 cc to 12 cc) spinal fluid could be obtained at each drainage during the first month of illness even though it was definitely under increased pressure on at least two occasions. The cell counts of the spinal fluid were very high, running from 14,700 to 13,700 during the first ten days. The patient never demonstrated any mental changes of any kind, was perfectly rational at all times and did not appear critically ill at any time. There was stiffness of the neck for over a month. During most of the illness his appetite was good, the bowels moved without cathartics or enemas and he rested well. The Wassermann reaction of the spinal fluid was negative on the eighth day of the meningitis but positive on the sixty-sixth day. From this we conclude that the cerebrospinal syphilis became manifest during

the course of treatment for gonococcal meningitis and probably occurred after June 21, at which time the spinal fluid cell count was 8 and the test for globulin was negative

## SUMMARY

1 Gonococcal meningitis is a rare clinical condition, we have found only twenty-two previously reported cases

2 In the case of gonococcal meningitis presented, recovery occurred

3 Gonococcal meningitis occurs in the presence of, or secondary to, gonococcal infections in other parts of the body

4 The mortality in the twenty-two reported cases was 45 per cent

5 Several clinical and laboratory features are brought out which differ from those usually found in cases of meningococcal meningitis

6 This patient was treated with 110,000 units of meningococcus antitoxin in addition to daily spinal drainage during the first five days of the disease without definite improvement

7 Sulfanilamide was used therapeutically after the gonococcus was definitely proved to be the organism causing the meningitis. Although it seemed that the patient was improving during the periods of sulfanilamide administration, we feel that this was probably coincidental

8 It is believed that other cases of this unusual complication of a very common infection have been overlooked in the past. Careful bacteriologic studies in cases of meningitis developing in the presence of a gonococcal infection may show this condition to be more common than now considered

## ANAPHYLACTIC REACTIONS FOLLOWING MEDICATION WITH PARENTERAL LIVER EXTRACT

CLEMENT I. KRANTZ, M.D., Duluth, Minn.

With the introduction of parenteral liver extract, a more effective treatment of pernicious anemia has resulted, with consequent benefit to many persons suffering from this disease. This has been especially true of those who were refractive to oral liver therapy, and the variety of symptoms complained of, as well as the constant low erythrocyte level in this group, has been overcome by injecting liver extract. However, because of the nature of the extract and at times even the preservative used, reactions have occurred. In 1931 Held and Goldbloom<sup>1</sup> reported a case of erythema nodosum following oral liver therapy. They were not convinced, however, that this was a true allergic reaction. Following the introduction of parenteral liver extract, Strandell and Hammar,<sup>2</sup> while studying patients refractive to oral liver medication, noted an urticarial eruption in one of their cases. In 1933 Murphy<sup>3</sup> reported its use in 1,000 cases, and he observed only two reactions. One of these patients exhibited nausea and urticaria following the twelfth injection. The Netherlands investigators<sup>4</sup> have observed "disagreeable phenomena following injection of liver extract." They have used "Cympolon"<sup>5</sup> or "Pernicemon"<sup>6</sup> and reactions to these have varied from slight, transient erythematous eruptions to severe asthmatic breathing with coincident tachycardia and hypotension. Engel<sup>7</sup> also observed similar states, but he was able to resume injections of liver extract after suitable desensitization. Grün<sup>8</sup> gave small but increasing doses of

extract to one of his patients who exhibited such sensitivity and finally was able to use an adequate amount of material in treating his patient. In commenting on the possible sensitivity to liver extract, *THE JOURNAL*<sup>9</sup> mentions that reactions have occurred only twice in a large series of cases in one clinic. One of these patients suffered from asthma and an attack developed immediately following an intravenous injection of liver extract. One manufacturing concern<sup>10</sup> reports that only six or eight reactions following parenteral liver therapy have come to its knowledge during the several years it has manufactured such extracts.

That another factor in liver extract may cause undesirable manifestations is suggested by Millbradt.<sup>11</sup> He attempted to overcome sensitivity to "spiroced" in a child with congenital syphilis and found that a red, itching exanthem appeared after several injections of liver extract. On further study he discovered that the liver extract per se did not cause the eruption but that the preservative did. After testing several similar compounds he concluded that the benzene ring caused these untoward reactions, and thus, of course, adds another substance for consideration in the unusual case.

Fortunately these reactions are rare and, because of this fact, it should not detract from the use of liver extract. Rather it should cause the physician to be on the lookout for evidence of sensitivity. Nevertheless, statements have been made that with liver extract the patient is "free from serum sickness and anaphylactic reactions."<sup>12</sup> The purpose of this report is to bring attention again to the fact that reactions may and do occur at varying times after parenteral treatment has been started and that, by due modification of the treatment, future untoward manifestations may be avoided.

## REPORT OF CASE

C. H., a man, aged 39, a telephone cable splicer, first seen in March 1930, complained of weakness, a sore tongue and discomfort in the upper part of the abdomen. Aside from these complaints he had enjoyed excellent health since childhood. He had not received injections of horse serum in the past. The only significant fact in his family history was that his mother had died from pernicious anemia.

The patient was well built but pale. The essential abnormal conditions were smoothness of the edges of the tongue, with a raw, beefy appearance at the tip, and diminution of the vibratory sense of the extremities. There was no evident icteric tint to the sclerae nor was the liver or spleen palpable. Examination of the blood revealed: Hemoglobin (Sahli) 58 per cent, erythrocytes 2,820,000 cells per cubic millimeter, color index 1+, leukocytes 6,250 cells per cubic millimeter, polymorphonuclear neutrophils 63 per cent, polymorphonuclear eosinophils 1 per cent, polymorphonuclear basophils 1 per cent, lymphocytes 27 per cent, monocytes 8 per cent. The erythrocytes were well filled with hemoglobin, but with marked changes in size, macrocytes predominating. Moderate variations in shape were found, but no erythroblasts were observed. The leukocytes and platelets, aside from being reduced in number, revealed no striking changes from normal. There was complete absence of free hydrochloric acid on gastric analysis.

As a result of these observations the patient was ordered to take liver and liver extract by mouth supplemented by dilute hydrochloric acid during meals. A prompt response resulted. The reticulocytes reached 38 per cent on the eighth day and after six weeks of medication the erythrocytes numbered 4,600,000 cells per cubic millimeter. There was a corresponding increase in his sense of well being and the tongue and symptoms of weakness cleared up.

In January 1932 he complained of feeling tired, especially in the extremities and thighs, and his daily work was an effort. The erythrocyte count remained between four and five million cells per cubic millimeter even after ventriculocath

1 Held, I. W., and Goldbloom, A. Addison-Biermer's Anemia (Pernicious Anemia). Report of Case Showing Allergic-like Phenomena to Liver Extract. *J. A. M. A.* 96:1361 (April 25) 1931.

2 Strandell, Barker, and Hammar, Emil. Magenresistente Fülle von Anämia perniciosa erfolgreich mit Cympolon behandelt. *Urtikaria als Komplikation. Acta med. Scandinavica* 77:345 1932.

3 Murphy, W. I. Maintenance of Normal Blood in Pernicious Anemia by Means of Intramuscular Injections of a Solution of Liver Extract. *Am. J. M. Sc.* 156:271 (Aug.) 1933.

4 Ceyssens, I. A. G. Orangenemie verschijnenselen na Toediening van Pernicemon. *Nederl. tijdschr. v. geneesk.* 80:1915 (Mar. 2) 1936.

5 Kupper, I. C. Overgevoelheids reactie na Leverinspuiting. *ibid.* 79:2771 (June 8) 1935. 6 Boovers, J. J. C. P. A. Orangenemie Verschijnenselen na Pernicemon inspuiting. *ibid.* 79:5148 (Nov. 2) 1935.

7 Engel, M. Byreacties na Inspecting van Leverextracten. *ibid.* 80:749 (Feb. 22) 1936.

8 Grün, George. Leberempfindlichkeit gegen parenterale verabreichte Leberpräparate bei einem Fall von perniziöser Anämie. *Wien. klin. Wchnschr.* 17:751 (June 15) 1934.

9 Possible Sensitivity to Liver Extract. *Queries and Minor Notes* *J. A. M. A.* 101:2019 (June 1) 1935.

10 Lederle Laboratories. Personal communication to the author.

11 Millbradt, W. Leber eine eigenartige schmerzende Allergie. *Leberextrakt. Dermat. Wchnschr.* 101:1595 (Dec. 21) 1935.

12 Wilson, J. A., and Carey, W. C. Further Observations on Parenteral Liver Extract Therapy in Pernicious Anemia. *Am. J. M. Sc.* 130:752 (June) 1937.

iron had been given in large doses. He was unable to regain the dexterity of his hands, so necessary in his work, and his legs would not respond to the usual demands of his occupation. Massage and other physical therapy resulted in only slight benefit.

His condition remained about the same until July 24, 1935, when parenteral liver extract was begun. His improvement began and the erythrocytes reached a normal level. November 23, after he had received the fifteenth injection of liver concentrate intramuscularly, he complained of feeling flushed, and his face and neck were more red than usual. This phenomenon lasted for about one hour. December 1 he again asked for a similar injection, because he had improved so much. A few hours later he experienced a generalized urticarial eruption and the following day the lymph nodes, particularly in the cervical and supraclavicular regions but also in the axilla and groin, were enlarged and tender. Epinephrine was given to relieve the marked pruritus, and recovery was complete in one week.

Despite this experience he returned December 10 and demanded a similar treatment. The numbness of his hands had returned and the weakness and instability of the extremities had gone away. He was warned of possible reactions but persisted in his demand. A fresh ampule of similar extract was then given in a dose of 1 cc. In a few minutes he broke out in a clammy, moist perspiration and typical asthmatic breathing with rhonchi throughout the chest followed. The pulse rate became accelerated and there was incontinence of the bladder. Epinephrine was immediately given and relief was obtained in a short time.

Following these manifestations he felt completely restored to normal. In view of the fact that he was refractory to oral liver medication, a new brand of liver extract was obtained and a small amount of diluted liver extract was given without reaction. The amounts were gradually increased until a few months later the full dosage was reached and no further reactions occurred.

In order to throw some light on what factor it might be that caused such reactions, scratch tests were made with beef, pork and horse meat, on the hypothesis that the liver used in the preparation of the parenteral extract was derived from these sources. Beef and pork caused no reaction, but a raised area 14 mm in diameter with a zone of erythema around it resulted from the test with horse meat.

#### SUMMARY

In the case reported here complete relief was not obtained from oral liver extract and only when the parenteral extract was given intramuscularly did the erythrocyte count remain normal and the distressing symptoms disappear. Varying gradations of allergic response to some factor in liver extract resulted after fourteen injections without reaction. At first merely a slight erythema resulted, but as the injections were continued urticaria, enlargement and tenderness of lymph nodes occurred and finally an anaphylactic reaction occurred characterized by asthmatic breathing, diffuse rhonchi in the chest and tachycardia. These symptoms were relieved by injections of epinephrine. Scratch tests indicated possible sensitivity to horse meat, and it is probable that the first extract used was derived at least in part from horse liver. When the treatment was modified by the use of small but increasing amounts of extract, no reactions resulted. It is possible, however, that the allergic factor may not have been present in the new extract used.

#### CONCLUSIONS

1. Complete relief from symptoms and restoration to normal erythrocytic levels may not always result from the use of oral liver medication but can be obtained when the parenteral extract is used.

2. Reactions do occur in susceptible individuals. They may appear after the first injection but are often delayed until a number of such treatments have been given.

3. Such manifestations are apparently of an allergic nature.

4. Due care must be observed when mild reactions occur, and a proper modification of treatment should then be used.

1014 Medical Arts Building

#### NODULAR GOITER OF THE NEW BORN WITH SUBSEQUENT ADENOCARCINOMA

G. ARNOLD STEVENS, M.D., HOLLYWOOD, CALIF., AND  
WILLIS W. WAITE, M.D., EL PASO, TEXAS

From an etiologic aspect as well as from the standpoint of rarity, the occurrence of goiter in infants is of interest. It is known that the thyroid glands of infant cretins are often from two to five times normal size in endemic regions.<sup>1</sup> The pathologic change in these glands is essentially a diffuse vascular or parenchymatous enlargement, according to Kautmann,<sup>2</sup> Boothby and Plummer<sup>3</sup> and others. Aschoff<sup>4</sup> and De Quervain<sup>5</sup> mentioned diffuse hyperplasia of the thyroid in the new-born ("struma, diffusa neonatorum") and Helmholz<sup>6</sup> has seen frank exophthalmic goiter in a child of 1 year.



Section of the adenocarcinoma in the nodule

We are not aware, however, of any reports in the literature of a single large encapsulated adenoma occurring in a new-born child. Pemberton<sup>7</sup> has seen a diffuse adenomatous colloid goiter which was said to be present at birth. C. H. Mayo<sup>8</sup> recently told one of us (Stevens) that he had not seen a congenital nodular goiter in the human being but that, when a young man, he had discovered the condition in a litter of four puppies. He operated on one of the animals and confirmed the diagnosis of goiter. Kaufmann makes the statement that true adenomatous goiter does not appear in children and Aschoff said that he had never seen the condition until after changing of the teeth. We report such a case. The interest in this case is increased by the discovery of an adenocarcinomatous area within the adenoma seven years after birth.

<sup>1</sup> Kaufmann, Edward. Pathology, Philadelphia, P. Blakiston's Son & Co. 1929, vol. 1. I. Feinschmidt, K. Koeppel, Sander, and Damber, quoted by Kaufmann.

<sup>2</sup> Boothby, W. M., and Plummer, H. S. Diseases of the Parathyroid and Thyroid Gland. Rochester, Minn., Schmitt.

<sup>3</sup> Aschoff, Ludwig. Lectures on Pathology. New York, Paul B. Hoeber, Inc. 1924, pp. 319-331.

<sup>4</sup> De Quervain, Fritz. Goitre. New York, Williams Wood & Co. 1924.

<sup>5</sup> Helmholz, H. T. Goitre in Children. Philadelphia, W. B. Saunders Company, 1937, p. 537, 1936.

<sup>6</sup> For oral communication to the authors.

## REPORT OF CASE

A girl, aged 7 years was brought to us because of a lump in her neck which had been present since birth. The parents stated that the tumor had not changed in size. This was subsequently confirmed by Dr Samuel King of Fort Stanton, N. M., who delivered the child. Her voice had been a little husky as long as the parents could remember. Other than this and the presence of the tumor, the child had always seemed perfectly normal both mentally and physically. The family had always lived in New Mexico and none had goiter. Examination revealed a firm smooth rounded mass about the size of the child's fist apparently attached to the left lobe of the thyroid. The mass moved with deglutition. No bruits or thrills were detected. There was no evidence of hyperthyroidism. Some dysphonia was present but the vocal cords were normal. Routine laboratory tests were negative and the child appeared to be in general good health.

Operation was performed by one of us (Stevens), assisted by Dr Samuel King and Bennie Jensen. A large spherical encapsulated mass was found to originate from the left lobe of the thyroid at the inferior pole. The recurrent laryngeal nerve was adherent to the capsule of the mass at a point near the entrance of the inferior thyroid artery to the gland. The nerve was gently freed from the capsule, which relieved its apparent tension. The inferior thyroid vessels were ligated and the mass was subsequently removed without difficulty.

## PATHOLOGY

The pathologic examination was performed by Dr Willis Waite.

The specimen consisted of an encapsulated globular mass measuring 70 by 60 by 50 mm and weighing 88 Gm. On section the tissue structure was fairly homogeneous and semitranslucent except for one pale grayish pink area well within the capsule.

Histologic section showed a growth of adenomatous tissue bordering on normal thyroid tissue, with the exception of the section through the pale area. This section was examined also by Drs Broders, Kernahan and Robertson of the Mayo Clinic, all of whom concurred in the diagnosis of grade 2 adenocarcinoma. Although glandular arrangement was for the most part in evidence, the presence of mitosis, irregular cell nuclei with prominent and relatively large nucleoli and invasion of the venules by the cells established the diagnosis of malignancy.

The patient made an uneventful convalescence and was dismissed from the hospital on the fourth postoperative day. The postoperative check showed the vocal cords to be normal. At the present time two years after the operation the child's voice is normal and the child is well.

## COMMENT

This case, although of interest chiefly because of its rarity, probably merits comment because of the etiologic factors involved. The child's parents did not have goiter. The mother was in good health at the time of the birth of the child. The child was born and raised and her parents have always lived in New Mexico, which is notably not in an endemic goiter region. The theories of lack of iodine and of infection then do not seem plausible in this case. Woelfler,<sup>7</sup> who contributed much to the subject of adenomas of the thyroid, believed that they develop from fetal rests. It is however, questionable whether any one has actually traced such a development. The presence of a single large adenoma projecting from the thyroid gland of this patient at birth and the absence of known predisposing factors seem to support Woelfler's theory at least to the extent that certain adenomas may develop from embryonal tissue. This case seems to throw additional light on the question of whether or not cancer develops from primarily benign adenomatous tissue. Certainly it seems logical to assume that this was originally a benign adenoma of the thyroid, since an adenocarcinoma could hardly be considered to be nonprogressive for seven years as was this nodule. Therefore one would conclude that the adenocarcinoma in this case had recently developed from simple adenomatous tissue.

202 Bing Crosby Building—116 Mills Street

THE USE OF THE LOW SALT DIET IN THE  
DIAGNOSIS OF ADDISON'S DISEASE

ALFRED LILIENFELD, M.D., NEW YORK

The use of a salt free diet for four or five days to aid in the diagnosis of Addison's disease in doubtful cases has recently been advocated. The precipitation by such a diet of a typical clinical crisis with accompanying changes in the chemistry of the blood is considered confirmatory. An adequate supply of potent cortical extract as well as intravenous salt solution must be kept on hand in the event of a severe crisis which appears to threaten life.

The following case is reported to show that the salt free diet may be a dangerous expedient, since sudden death may occur without the development of critical symptoms.

## REPORT OF CASE

*History*—H. L., a man, aged 52, Austrian, complained of dyspnea and weakness for three and a half months. He had a chronic nonproductive cough, had lost 15 pounds (6.8 kg) during this period and had noted constipation for three weeks. On the day of admission the patient became dizzy, had black spots before the eyes, and vomited.

The past history was essentially irrelevant except for an illness diagnosed as pneumonia in 1923, during which tapping of the chest on the right side yielded clear fluid.

The family history was noncontributory, the father died of unknown causes, the mother was 80 years old and in good health. Three brothers and sisters were living and well. There was no familial tuberculosis, cancer, diabetes, kidney or heart disease, nor was there any evidence of allergy.

*Examination*—The patient was well developed and well nourished and had a dusky and somewhat violaceous tinge to his skin. There was no orthopnea or apparent dyspnea. There was slight and somewhat questionable pigmentation of the mucous membrane of the right cheek and on the dorsum of the tongue. The pupils were equal and regular and reacted to light and in accommodation. The extraocular movements and the sclerae were normal. The fundi showed no changes. The ears, nose and throat were normal. A few remaining teeth were carious. The trachea was in the midline. There was no adenopathy or thyroid enlargement. The heart was normal in size, the sounds were clear and there were no murmurs. The pulmonary second sound was equal to the aortic second sound. There was regular sinus rhythm. The blood pressure was 100 systolic, 70 diastolic. The peripheral vessels were in good condition. There was slight impairment of resonance and diminution of breath sounds over the right upper part of the chest posteriorly. A few rales were heard over the right upper part of the chest anteriorly. Examination of the abdomen showed no masses, tenderness or increased resistance. The rectal examination was negative. The prostate was normal. There was moderate clubbing of the fingers and definite cyanosis of the finger tips. The neurologic examination was negative except for bilateral ankle clonus and a questionable bilateral Babinski reflex.

Laboratory studies revealed the following. The urine was clear, acid, with a specific gravity of 1.020, albumin 0, sugar 0, and no microscopic changes. Blood count: Red blood cells 4,900,000, hemoglobin 103 per cent, white blood cells 7,700 polymorphonuclear leukocytes 70 per cent, lymphocytes 25 per cent, monocytes 5 per cent. Two days later the hemoglobin was 110 per cent. The Wassermann reaction was negative.

Blood chlorides were 356 mg per hundred cubic centimeters. A sugar tolerance test could not be completed because the patient vomited the dextrose. The fasting blood sugar was 83 mg per hundred cubic centimeters. Examination of the blood showed 10 per cent methemoglobin.

Gastric analysis. Fasting specimen showed no free hydrochloric acid, total acidity 4. Fifty-five minutes after administration of histamine free hydrochloric acid was present and the total acidity increased to 70.

X-ray examination of the chest revealed a productive infiltration tuberculous in type involving the apical and subapical regions of both lungs.

From the Second (Correll) Medical Division of Bellevue Hospital, and the Department of Medicine, Cornell University Medical College.

<sup>7</sup> Woelfler, quoted by Boothby and Plummer.<sup>2</sup>

A flat x-ray plate of the abdomen did not show calcification of the adrenals and was negative in other respects

An electrocardiogram showed diphasic T waves in leads 1 and 2

The basal metabolic rate was minus 23 per cent

The spinal fluid contained 6 lymphocytes per cubic millimeter and was negative for albumin. The Wassermann and colloidal gold tests were negative

**Course**—The temperature and pulse were normal except on one occasion when there was a rise in temperature to 102.4 F accompanied by headache and numbness of the legs. The blood pressure ranged between 100 systolic, 70 diastolic and 90 systolic, 60 diastolic. The patient's appetite was poor and he complained in general of not feeling well. If he attempted to stand or even to sit up a complete vasomotor collapse was induced, the pulse would become rapid and weak, the blood pressure would drop abruptly so that a reading could not be obtained and the patient became very pale and perspired profusely.

In view of the fact that the diagnosis of Addison's disease might be contested on the ground that the pulmonary tuberculosis per se could account for the entire picture, and since the general discoloration of the skin could have been explained by the methemoglobinemia, the patient was put on a salt free diet in order to precipitate a crisis and to aid in the establishment of the diagnosis of Addison's disease. There was no perceptible change in the patient's condition after four days on this regimen and it was decided to discontinue the salt free diet and to administer salt intravenously and by mouth the next day. We were, however, not given this opportunity. At 3:40 a. m. the following day the patient complained of pain in the left side of the chest anteriorly which did not radiate. The heart sounds were somewhat weak but the patient did not seem very ill. The pain was apparently relieved by the administration of 10 grains (0.65 Gm.) of acetylsalicylic acid and one half grain (0.03 Gm.) of phenobarbital. The patient slept from 3:50 until 4 a. m. At this time he awakened and seemed restless but made no complaints. He was left for a few moments by the nurse and on her return was found dead.

**Autopsy**—This was performed by Dr. Milton Helpert of the Medical Examiner's Office, through whose courtesy the following summary of the pertinent observations is added.

The heart was normal in size and weighed 330 Gm., the valves were flexible and natural in appearance. The coronary arteries showed a moderate degree of sclerosis with no stenosis or occlusion. The endocardium was smooth. The aorta showed a slight amount of sclerosis and loss of elasticity. The lungs presented numerous adhesions. The upper left lobe showed much scarring of the parenchyma with depression of the visceropleura. On section there was overgrowth of interstitial connective tissue and an area of tuberculous infiltration marked by grayish brown pigmentation. There was similar involvement of the upper portion of the left lower lobe with clusters of conglomerate tubercles. The right lung showed extensive fibrous distortion of the parenchyma and bronchi in the upper lobe with nodular induration and contraction of the tissues. There was also some interstitial fibrosis in the middle lobe. There was no fresh caseous tuberculosis in either lung, the process being essentially a fibrotic one in the right lower lobe and a productive one in the left.

Examination of the gastro-intestinal tract showed that the esophagus was normal. The stomach showed merely some postmortem digestion. The intestine and appendix were normal. The liver and spleen were slightly enlarged and congested. The pancreas was normal. The adrenals were indurated. On section there appeared to be almost complete replacement by fibrocaceous tuberculosis. The right adrenal was 2 1/4 inches (5.7 cm.) long, 1 inch (2.5 cm.) wide and nine sixteenths inch (1.4 cm.) thick and was firmly adherent to the surrounding fat tissue. No cortical substance could be made out. The left adrenal was slightly smaller and showed similar changes. The kidneys were slightly increased in size and showed congestion with exaggeration of the markings. The pelves, ureters and bladder were normal. The prostate and testes were normal in size and showed no tuberculous involvement.

Examination of the skull showed no injury. The dura was intact and slightly adherent at the base. There was some pial

edema and congestion. The vessels at the base of the brain showed slight sclerosis. The pons, cerebellum, brain stem and basal ganglions were intact. The pituitary was normal.

**Microscopic Examination** The myocardium was normal, there was intimal thickening of the coronary arteries, the aorta showed no changes. The lungs showed multiple areas of fibrosis with small areas of caseation in some of them. There were many giant cells and tubercles, some conglomerate. There were focal collections of lymphocytes, especially at the periphery of the fibrosis, and some small areas of hemorrhage. The surrounding alveoli showed considerable congestion with diapedesis of red cells into the alveolar spaces, accompanied by large mononuclear phagocytes. The arteries in the area of fibrosis showed a moderate amount of intimal proliferation.

Sections of the spleen showed only congestion. The liver showed congestion and moderate fatty degeneration. The pancreas showed autolysis and slight interlobular fibrosis. Some sections of the adrenal showed complete replacement by a caseous mass undergoing some calcification and enclosed in a thick avascular fibrous capsule having focal and general round cell infiltration with no tubercles or giant cells. Other sections showed marked engorgement and autolysis of the cells but appeared to contain all the lavers.

The kidneys showed normal architecture with some engorgement of the glomerular capillary tufts. A few of the small arteries showed slight intimal thickening.

The bone marrow was normal on section.

#### COMMENT

It is well known of course that sudden death is common in Addison's disease, and its occurrence in this case may have been entirely fortuitous. Nevertheless, we regretted that we had not applied the therapeutic test rather than the purely diagnostic one.

121 East Sixtieth Street

## Special Articles

### THE PHYSIOLOGY OF VITAMIN B<sub>1</sub>

GEORGE R. COWGILL, PH.D.

From the Laboratory of Physiological Chemistry, Yale University  
NEW HAVEN, CONN.

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed.*

As the papers of this series are planned to be a continuation of those of an earlier series, no attempt will be made here to review at all completely the voluminous literature bearing on the physiology of vitamin B<sub>1</sub>. The historical development of the subject, the various methods which may be followed in assaying for this vitamin, the importance of the vitamin for growth, lactation and other functions, and similar topics concerning which our fundamental knowledge has been established for many years—all of these will be omitted from the present discussion. Instead, the objective will be to survey briefly the more recent contributions to knowledge in this field, to summarize as briefly as possible the present points of view concerning the relation of vitamin B<sub>1</sub> to various bodily functions, to describe the unique function of this dietary factor, if there is such, and finally, to indicate wherever possible the significance in medicine and practical dietetics of our present knowledge.



DISTRIBUTION OF VITAMIN B<sub>1</sub> IN THE BODY

It is conceivable that knowledge of the relative distribution of vitamin B<sub>1</sub> in the body may assist in our understanding of its possible functions. We are concerned here not with the usefulness of such information in relation to relative food values of the various tissues but rather with its bearing on the function of vitamin B<sub>1</sub>.

The earlier literature on this subject emphasized a similarity of distribution of the so-called nucleins and vitamin B<sub>1</sub>, and on this observation was based the idea that this dietary essential has some important role in the functioning of every cell rather than in the activity of a special organ or tissue system. More recent studies have enlarged the body of available data without seriously altering the conclusions drawn from them. Westenbrink<sup>1</sup> performed feeding experiments with the tissues of normal and B<sub>1</sub> deficient rats and found the heart, liver and kidney to have the highest content of vitamin B<sub>1</sub> under normal conditions, the last two organs evidently acting as storehouses for the dietary factor. All of the organs examined except the brain were observed to suffer great diminution in their vitamin B<sub>1</sub> content after the rats had subsisted for five weeks on the B<sub>1</sub> free diet. Essentially similar results were obtained by Graham and Griffith<sup>2</sup>. In this connection it is pertinent to say that in 1923 Nagayo<sup>3</sup> cited the presence of vitamin B<sub>1</sub> in the tissues of patients who had died of beriberi as strong evidence for the view that beriberi is not due essentially to vitamin B<sub>1</sub> deficiency. I do not believe that the validity of the deficiency disease theory requires that the tissues become absolutely devoid of the vitamin before characteristic symptoms and pathologic changes may occur, but merely that the concentration in the various organs, or perhaps in certain special organs, must become less than a critical or threshold value. Furthermore, it is reasonable to believe that the different organs will respond to the condition of low vitamin supply in various ways. Such a point of view appears consonant with all the data now at hand.

The amounts of vitamin found in the various tissues under different dietary regimens support the conclusion that the organism's capacity to store vitamin B<sub>1</sub> is limited. In the pigeon, the rat and the dog, the time required for a shortage of vitamin B<sub>1</sub> to become evident varies from about ten days to three or four weeks, the latter period being characteristic of the largest of these species, the dog. This limited capacity for storage is obviously of great importance in relation to clinical situations as well as in practical dietetics and hygiene.

Students interested in the quantitative aspects of this topic will find the data of Brodie and MacLeod<sup>4</sup> worthy of examination. These investigators reported that in animals subsisting on normal diets the liver is found to contain about ten times as much vitamin B<sub>1</sub> per gram as voluntary muscle, the kidney is about one-half and the brain approximately one-third as rich per gram as voluntary muscle. The heart is almost as rich as the liver. Only traces of the vitamin are

found in the blood, spleen and lungs. It was found that within certain limits the vitamin B<sub>1</sub> content of the body is undoubtedly influenced by the amount of vitamin in the diet, a conclusion harmonizing well with the results of many other types of investigations.

The suggestions in the literature (1) that vitamin B<sub>1</sub> functions in some way in the metabolism of one or more of the energy-yielding foodstuffs, probably carbohydrate, and (2) that fat in some way "spares" vitamin B<sub>1</sub> (discussed later in this paper) led Westenbrink<sup>5</sup> to study the disappearance of vitamin B<sub>1</sub> from certain organs of pigeons subsisting on B<sub>1</sub>-free, carbohydrate-rich, fat-poor diets as compared with those subsisting on B<sub>1</sub>-free, carbohydrate-free, fat-rich combinations of food. In view of his results, Westenbrink considered it unlikely that the appearance of polyneuritis after shorter or longer periods of the feeding of large amounts of carbohydrate or fat can be explained as due simply to the more rapid or slower disappearance, respectively, of vitamin B<sub>1</sub> from the organism. Some other factor seems to be involved.

For some time it has been known that vitamin B<sub>1</sub> is present in the urine and that the amount may vary with that furnished in the diet, a plethora of vitamin in the blood and the entire body evidently being associated with increased elimination of the dietary essential through the kidney. As the vitamin is water soluble, its presence in the urine is easily understood. The fact that the amount thus eliminated can vary with that available within the organism is important to the physiologist and the clinician. On it one may base a search for a vitamin B<sub>1</sub> function test by which to detect persons who do not have their tissue reservoirs "saturated" with the vitamin. This fact is also important because on it rests the possibility that vigorous activity of the kidney, as for example in pronounced diuresis, may mean an increased elimination of vitamin B<sub>1</sub> from the body, to its possible detriment. Tests of this possibility by experiments with dogs<sup>6</sup> have in fact yielded positive results.

Harris and Leong<sup>7</sup> and others have examined experimentally the possibility of a vitamin B<sub>1</sub> function test based on quantitative examination of the urine secreted under definite conditions. The reader is referred to the original papers for details. Let it suffice to state here that, in the opinion of these investigators, "a daily excretion of less than 12 international units (corresponding with an average concentration of 1 I U per 100 cc) raises the presumption that the diet contains less than a normal allowance of vitamin B<sub>1</sub>." With the isolation and synthesis of pure vitamin B<sub>1</sub> and therefore its availability, and the perfection of microchemical methods by which to analyze the urine for this factor, it is likely that other vitamin B<sub>1</sub> function tests will be devised which are accurate yet more saving of time in their performance. The application

1. Westenbrink H. G. K. Ueber den Gehalt an Vitamin B<sub>1</sub> der Organe von weissen Ratten bei normaler und Vitamin B<sub>1</sub> freier Ernährung. Arch. neerl. de physiol. 17: 560-577, 1932.

2. Graham, Claire and Griffith W. H. Vitamin B<sub>1</sub> and B<sub>2</sub> in Tissues of Normal and Experimental Rats. Proc. Soc. Exper. Biol. & Med. 29: 692-697 (Feb.) 1932.

3. Nagayo Mataro. Beriberi and Rice Neuritis. J. A. N. A. 51: 1435-1437 (Oct. 27) 1925.

4. Brodie, Jesse B. and MacLeod, Florence L. Quantitative Experiments on the Occurrence of Vitamin B in Organs. J. Nutrition 10: 179-186 (Aug.) 1932.

5. Westenbrink H. G. K. Ueber das Verschwinden des Vitamins B<sub>1</sub> aus einigen Organen von Tauben bei Vitamin B<sub>1</sub> freier, kohlehydratreicher, fettarmer Nahrung bzw. bei Vitamin B<sub>1</sub> freier, kohlehydratfreier, fettreicher Nahrung, nebst einer Vergleichung des Vitamin B<sub>1</sub> Gehaltes von Organen von Ratten und Tauben. Arch. neerl. de physiol. 19: 116-121, 1934.

6. Cowgill G. R., Roenberg H. A. and Rogoff J. Studies in the Physiology of Vitamins. XIV. The Effect of Administration of Large Amounts of Water on the Time Required for the Development of the Anorexia Characteristics of a Deficiency of the Vitamin B Complex. Am. J. Physiol. 95: 537-541 (Dec.) 1930.

7. Harris L. J. and Leong P. C. Vitamins in Human Nutrition. The Excretion of Vitamin B<sub>1</sub> in Human Urine and Its Dependence on the Dietary Intake. Lancet 1: 896 (April 18) 1936. Heller O. M. Vitamin B<sub>1</sub> and B<sub>2</sub> Content of Human Urine. Proc. Soc. Exper. Biol. & Med. 32: 1187 (April) 1935. Roscoe Margaret H. The B Vitamins in Human Urine. Biochem. J. 20: 1023 (June) 1936.



of such methods in the survey of patients in the clinic and in representative groups of the normal population should result in numerous interesting and valuable observations

#### VITAMIN B<sub>1</sub> AND THE ALIMENTARY TRACT

Recent additions to the literature bearing on vitamin B<sub>1</sub> and the alimentary tract have not been such as to warrant any serious changes in the view held hitherto, that lack of vitamin B<sub>1</sub> does not produce any specific dysfunction of the organs of the alimentary tract. Sure and Thatcher<sup>8</sup> were able to confirm an earlier report<sup>9</sup> that gastric ulcers appear in a large percentage of white rats subsisting on a B<sub>1</sub>-deficient diet and therefore suggested that vitamin B<sub>1</sub> therapy may be indicated in the treatment of gastric ulcers in human beings. The failure to secure ulcers in practically every case, however, constitutes an argument in favor of the view that the ulcers arise secondarily in the course of vitamin B<sub>1</sub> deficiency, probably as part of the response of the stomach to a generalized systemic condition and not because the function of vitamin B<sub>1</sub> is specific in relation to this organ.

Babkin<sup>10</sup> has reported interesting observations suggesting a relation of vitamin B<sub>1</sub> or some other member of the B complex to the nervous mechanism controlling gastric secretion. Dogs and cats, suitably operated on so as to permit experiments of the sham feeding type, were allowed to subsist on a diet deficient in the B complex and then were tested for their gastric responses to sham feeding, subcutaneous injections of histamine and the presence of food and 5 per cent alcohol solution in the intestine. During the state of vitamin deficiency there was a marked diminution in the response of the gastric glands to all of these stimuli. When yeast was administered the responses became normal within a few days. The effective agent in the yeast was not determined. These results are of interest because they suggest a possible explanation of the anorexia so characteristic of vitamin B deficiency. It will be recalled that earlier attempts to explain this anorexia by study of the effects of vitamin B deficiency on the so-called hunger contractions of the empty stomach,<sup>11</sup> while yielding interesting results, nevertheless failed to furnish the desired explanation. The origin of this anorexia still remains an unsolved problem.

Studies have been made of the efficiency with which various enzymes of the alimentary tract can function in the presence of vitamin B deficiency. Sure and his associates<sup>12</sup> reported *in vitro* experiments indicating that no impairment of tryptic and ereptic digestion of casein is associated with B deficiency. Such a result conforms well with those recorded in the earlier literature. With respect to the activity of pancreatic lipase, however, a pronounced decrease was noted. The significance of these *in vitro* results is questionable in

view of the *in vivo* observations of Salmon and Goodman<sup>13</sup> that in rats there is no impairment in the digestion of fat as a result of vitamin B<sub>1</sub> deficiency.

Reder and Gallup<sup>14</sup> reported that rats lacking both vitamin B<sub>1</sub> and vitamin G exhibit slower digestion and absorption of administered carbohydrate than normal control animals. When vitamin B<sub>1</sub> is added to the diet the rate does not improve, however the addition of vitamin G to the ration proves effective. These results, apart from their significance in relation to the theme under discussion, emphasize to the investigator in this field the importance of planning his experiments so as to be able to attribute his results more specifically to vitamin B<sub>1</sub> or other well defined members of the B complex.

As anorexia is a common characteristic of vitamin B<sub>1</sub> deficiency and its presence necessarily means some degree of inanition, students of the physiology of vitamin B<sub>1</sub> have learned to appreciate the importance in their experiments of making simultaneous observations on control animals receiving the vitamin but restricted in their intake of the basal diet to the amount ingested voluntarily by the B<sub>1</sub>-deficient animals. When such control observations are made, it is astonishing how many of the differences from normal function that have been reported have proved to be nonspecific, appearing in the undernourished control animals as well. This proved again to be the case in the recent work reported by Chatterjee,<sup>15</sup> who studied the motor functions of the intestine in the presence of B<sub>1</sub> deficiency. In both the vitamin-deprived and the starved animals there was a definite decrease in the amplitude, the number and the intensity of the intestinal contractions, as well as in the responses to pilocarpine, atropine, nicotine and barium chloride.

Molitor and Sampson<sup>16</sup> have tested the influence of pure vitamin B<sub>1</sub> on intestinal motility, using isolated rabbit's intestine suspended in Ringer's solution as well as taking observations of the intestine *in situ*. The experiments included study of the contractions under normal conditions and after the movements had been paralyzed with papaverine. The addition of pure vitamin to the Ringer solution, as well as the intravenous injection of vitamin in the *in situ* experiments, was without any effect on the movements. Evidently, then, this agent, unlike various drugs, has no demonstrable effect on the intestine of the normal organism, its action is exerted up to the point required by the animal but not beyond.

Vitamin B<sub>1</sub> is readily absorbed from both the small and the large intestine, and in all probability people may vary with respect to the efficiency of such absorption. When making vitamin B<sub>1</sub> assays with pigeons by a technic involving the administration of materials by way of the crop, I<sup>17</sup> have frequently found a bird which requires much more vitamin B<sub>1</sub> than other comparable birds of a series. This difference may theoretically be due to less efficient absorption but it might also be the result of a more ready elimination through

8 Sure, Jarnett and Thatcher. II. S. Avitaminosis. VI. Production of Gastric Ulcers in the Albino Rat as a Result of Specific Influence of Deficiency of Vitamin B. *Arch. Path.* **16**: 809-816 (Dec.) 1933.

9 Dr. Idorf, Gilbert and Kellogg. Minerva. Incidence of Gastric Ulcer in Albino Rat Fed Diets Deficient in Vitamin B (B<sub>1</sub>). *J. Exper. Med.* **56**: 191-198 (Sept.) 1932.

10 Babkin, B. P. Nervous Control of Gastric Secretion and Effect of Vitamin Deficiency on Its Production. *Canad. M. A. J.* **29**: 59 (July) 1933.

11 Cowgill, C. R., Devel, H. J. Jr., Plummer, A. and Meser, F. C. Studies in the Physiology of Vitamins. IV. Vitamin B in Relation to Gastric Motility. *Am. J. Physiol.* **77**: 389-401 (July) 1926.

12 Sure, Barnett, Kirk, M. C. and Buchanan, Kathryn S. Enzyme Efficiency in Avitaminosis. I. Influence of Vitamin B Deficiency on Tryptic and Ereptic Digestion of Casein. *J. Biol. Chem.* **108**: 19-26 (Jan.) 1935. II. Influence of Vitamin B Deficiency on Efficiency of Pancreatic Lipase. *J. Biol. Chem.* **108**: 27-33 (Jan.) 1935.

13 Salmon, W. D. and Goodman, J. G. Alleviation of Vitamin B Deficiency in the Rat by Certain Natural Fats and Synthetic Esters. *J. Nutrition* **13**: 477-500 (May) 1937.

14 Reder, Ruth and Gallup, W. D. The Rate of Digestion and Absorption During Avitaminosis B and G. *Proc. Oklahoma Acad. Sc.* **15**: 58-61 1933.

15 Chatterjee, D. D. Motor Functions of the Bowel in Avitaminosis B and in Starved Animals. *Indian J. M. Research* **22**: 191-198 (July) 1935.

16 Molitor, H. and Sampson, W. L. Personal communication to the author from the Merck Laboratory of Therapeutic Research, Rahway, N. J.

17 As an illustration see pigeon 25, table 2, page 37 in Cowgill, G. R. The Vitamin B Requirement of Man. New Haven Conn. Yale University Press, 1935.

the kidney or more rapid consumption in metabolic processes. Some observations<sup>18</sup> have been made of the absorption of various vitamin B<sub>1</sub> products when placed in the large intestine of the dog through a valvular cecostomy. From such experiments it appears that vitamin B<sub>1</sub> is not readily eluted from a fullers' earth adsorbate in the large intestine, and such a product therefore is less effective than others which contain the vitamin already dissolved in a suitable aqueous medium. These observations are of significance to clinicians who may desire to give vitamin B<sub>1</sub> to patients having a fistula in the large intestine. Evidently not all vitamin B<sub>1</sub> products are of equal value for such therapeutic use.

Even when administered by mouth, products of the type of fullers' earth adsorbate, such as the present international vitamin B<sub>1</sub> standard, do not give up all of their adsorbed vitamin when passing through the alimentary tract. Sampson and Keresztesy<sup>19</sup> have been able to show that elution with quinine sulfate solution yields approximately twice as much vitamin as elution by the older methods involving alkaline solutions. In the light of these facts it is reasonable to assume that the variable biologic effects reported by workers using adsorbates are due to different degrees of elution of the vitamin within the intestine.

It is theoretically possible that vitamin B<sub>1</sub> may be lost from the body under the conditions of chronic diarrhea. This question has been examined experimentally.<sup>20</sup> It appears that diarrhea merely causes some failure of absorption of an appreciable fraction of the ingested vitamin; it does not cause an excretion of vitamin B<sub>1</sub> from the organism through the intestinal wall into the lumen of the intestine.

The presence of vitamin B<sub>1</sub> in the feces has led many investigators to endeavor to determine its origin. In view of the observations of numerous workers it appears likely that this vitamin is synthesized by certain bacteria and other micro-organisms. Bechdel and his associates<sup>21</sup> reported that the cow is able to synthesize vitamin B<sub>1</sub> in its rumen through the activity of certain bacteria and thus derive the benefits of the synthesized products without the necessity of reingestion of feces, as is the case with the rat and other animals. In the case of the rat it appears from the work of Guerrant and his collaborators<sup>22</sup> that the type of carbohydrate in the ration has some role in this process. Sucrose, dextrose and starch, being usually assimilated quite rapidly, rarely reach the cecum in appreciable amounts, and it was shown that the elaboration of vitamin B<sub>1</sub> takes place in this region of the intestine.

In his summary of this work Dutcher<sup>23</sup> added "Dextrin, on the other hand is digested and assimilated at a slower rate, with the result that this carbohydrate reaches the cecum, where organisms (probably yeasts) have an opportunity to multiply. These organisms synthesize the B<sub>1</sub> and G complex, which is not

readily assimilated in the lower bowel but is voided in the feces. Lactose occupies an intermediate position between the soluble sugars and dextrin."

Dutcher mentioned yeasts as possible organisms in this connection, but Shimoda<sup>24</sup> reported *Bacillus coli* as having been proved in his experiments to be able to synthesize vitamin B<sub>1</sub>. In this explanation of the results yielded by the trials with different carbohydrates, it is assumed that synthesized vitamin B<sub>1</sub> is thrown out into the semifluid chyme and thus made available for absorption. In some unpublished experiments Weinstein and I grew pure cultures of organisms supplied by Bechdel and reputed to be capable of synthesizing vitamin B<sub>1</sub>. Biologic tests of such material for B<sub>1</sub> content led to the conclusion that any vitamin present in the tested products is contained in the bacterial cells instead of being secreted into the medium by the cells. If one is permitted to generalize from this conclusion, it would seem (1) that any vitamin B<sub>1</sub> made available to the host by bacterial action within the large intestine must arise from dead and decomposed bacteria and (2) that variations in the amount of the vitamin found in the feces probably represent variations in the growth of the B<sub>1</sub>-containing organisms.

Practically all the tests made of the feces have involved feeding of the excreta to animals, and in this case the bacterial bodies would be subjected to the action of the digestive juices secreted in the upper parts of the alimentary tract. The work of Guerrant and his associates previously cited shows that in the rat the synthesis of vitamin B<sub>1</sub> by micro-organisms takes place in the cecum, and for the animal to obtain the benefit of this elaboration of vitamin it must ingest the feces. On the other hand, if the vitamin could be synthesized in the small intestine by a process resulting in the presence of the vitamin in the liquid chyme outside the bodies of the synthetically active cells, the gross phenomena presented by the animals would be essentially those characteristic of refection.<sup>25</sup>

#### VITAMIN B<sub>1</sub> AND THE HEART

Phenomena referable to the heart have long been known as characteristic of beriberi in human beings. It is natural therefore that physiologists should be interested in the relation of vitamin B<sub>1</sub> to cardiac function. The most striking recent contribution to knowledge of this subject<sup>16</sup> is the fact that pure vitamin B<sub>1</sub> has no specific influence on the normal heart, only in the B<sub>1</sub>-deficient organism does administration of the vitamin result in a demonstrable effect.

In rats subsisting on B<sub>1</sub>-deficient diets bradycardia eventually appears, and Birch and Harris<sup>26</sup> have made this the basis of a technic for assay of vitamin B<sub>1</sub>. In this connection, however, it is pertinent to point out that one cannot generalize with respect to the phenomenon of bradycardia, which undoubtedly occurs in the B<sub>1</sub>-deficient rat. Unpublished observations by Hoff, Street and me indicate that slowing of the heart rate is not a characteristic feature of vitamin B<sub>1</sub> deficiency in the dog. It is true that the enlargement of the right side of the heart so characteristic of beriberi in human beings occurs with experimental B<sub>1</sub> deficiency produced in different species of animals, but the physiologic

18 Cowgill G R and Weinstein L. Unpublished observations.  
19 Sampson W L and Keresztesy J C. A Comparison of Some Methods for the Extraction of Vitamin B<sub>1</sub> from International Standard Acid Clay. *Proc. Soc. Exper. Biol. & Med.* **26**: 30-32 (Feb.) 1937.

20 Dann Margaret and Cowgill G R. The Influence of Diarrhea on the Vitamin B<sub>1</sub> Requirement to be published.

21 Bechdel S I, Honeywell Hannah E, Dutcher R A and Knutson M H. Synthesis of Vitamin B<sub>1</sub> in the Rumen of the Cow. *J. Biol. Chem.* **80**: 231-238 (Nov.) 1928.

22 Guerrant A B, Dutcher R A and Tomev L F. The Effect of the Type of Carbohydrate on the Synthesis of the B Vitamins in the Digestive Tract of the Rat. *J. Biol. Chem.* **110**: 233-243 (June) 1935.  
Guerrant A B, Dutcher R A and Brown R A. Further Studies Concerning the Formation of the B Vitamins in the Digestive Tract of the Rat. *J. Nutrition* **13**: 303-313 (March) 1937.

23 Dutcher R A. Recent Trends in Vitamin Research. *J. Home Econ.* **25**: 621-629 (Nov.) 1936. See page 629.

24 Shimoda Y. of the Municipal Hygienic Laboratory Osaka. In personal communication to the author.

25 Bliss Sidney and Green Fred. Refection in the Rat. *J. Nutrition* **11**: 119 (Jan.) 1936.

26 Birch T W and Harris I J. Bradycardia in the Vitamin B<sub>1</sub> Deficient Rat and Its Use in Vitamin B<sub>1</sub> Determination. *J. Biol. Chem.* **60**: 621-624 (1944).

response which this organ shows to lack of the vitamin is not the same in all species. The reader interested in this question will find an excellent summary of the facts bearing on the question of the identity of experimental vitamin B<sub>1</sub> deficiency with beriberi in the paper by Shimazono,<sup>27</sup> this author also discussed the differences in the pictures of B<sub>1</sub> deficiency presented by different species of animals.

Aalsmeer and Wenckebach<sup>28</sup> have studied the heart in cases of beriberi and advanced the suggestion that it is essentially an edematous organ. To describe the condition as hypertrophy is certainly incorrect, because the heart can return to normal size within a remarkably short time after institution of vitamin B<sub>1</sub> therapy. The recent observation made in Dr A. B. Hastings' laboratory at Harvard that, in the presence of B<sub>1</sub> deficiency the tissue of the auricle, in contrast to that of the ventricle, shows a marked reduction in oxygen uptake from the normal, constitutes proof that these two parts of the heart respond differently to a shortage of vitamin B<sub>1</sub> and that the auricle is more sensitive in this respect than the ventricle. On this basis I offer the suggestion that, because of this greater sensitivity of the auricle, this part of the heart becomes weaker, loses tone and as a result suffers greater mechanical distention in the presence of the pressure exerted by the circulating blood. If this view is correct, one should expect that administration of the vitamin would among other things restore in considerable measure the lost tone, with the result that the right side of the heart would show a prompt return to normal size. It is obvious that this cannot be the complete explanation because much of the enlargement of the right side of the heart involves the right ventricle as well as the auricles.

#### VITAMIN B<sub>1</sub> AND THE NERVOUS SYSTEM

The pathology of vitamin B<sub>1</sub> deficiency is treated elsewhere and therefore will not be discussed here. Let it suffice to remind the reader that polyneuritis has always been one of the striking features of beriberi in human beings and of the advanced stages of experimental vitamin B<sub>1</sub> deficiency. This fact has led many clinicians to test the efficacy of this vitamin in treating various conditions in which polyneuritis is a feature of the syndrome. It has been possible to show that the polyneuritis exhibited by many alcohol addicts<sup>29</sup> is to be attributed to lack of vitamin B<sub>1</sub> rather than to a specific toxic action of the alcohol on nervous tissue. Likewise, many patients with polyneuritis associated with pregnancy<sup>30</sup> and various clinical conditions<sup>31</sup> have responded favorably to vitamin B<sub>1</sub> therapy, which suggests that under the clinical conditions prevailing in the United States certain of the effects of vitamin B<sub>1</sub> deficiency have been occurring without proper recognition by the clinician. Obviously such observations as

these are of great importance in relation to the question of the adequacy of the supply of vitamin B<sub>1</sub> to these classes of patients.

Administration of the vitamin to patients with pernicious anemia,<sup>32</sup> however, has had no effect on the nervous features of the disease which were due to involvement of the cord, although there was a more generalized improvement, evidenced by the patient's sense of well being and interest in food. If it is assumed that the damage to the spinal cord in these cases was irreparable, such a result is readily explained. Owing to the conflicting views<sup>33</sup> concerning the development of lesions of the cord as a result of specific vitamin B<sub>1</sub> deficiency, it is possible to take the view that administration of the vitamin should not be expected to improve the neurologic picture characteristic of pernicious anemia. Of course the patients may have been receiving a suboptimal supply of the vitamin, in which case administration of this dietary factor should result in a general improvement, which would be difficult, however, to define in precise terms.

The rotational movements frequently exhibited by animals suffering from specific vitamin B<sub>1</sub> deficiency suggest some lesions in the vestibular nuclei. Church<sup>34</sup> has offered evidence in support of this view. He has reported the discovery in the rat of perivascular hemorrhages in this region. The fact that these movements are not seen in all experimental animals suggests that the causative lesions in the brain are not of universal occurrence but instead are secondary to more fundamental tissue changes resulting from specific lack of vitamin B<sub>1</sub>.

Church<sup>35</sup> has also suggested a method of vitamin B<sub>1</sub> assay based on his observation that B<sub>1</sub>-deficient rats show a prolonged duration of rotary nystagmus. Although this may be true for the rat it does not appear to be the case with the dog according to my own experiments. In the latter species marked changes in the nystagmus were noticed only in the most advanced stage of B<sub>1</sub> deficiency and then not uniformly in all animals. Evidently there is again a failure of all species to show the same response to lack of this dietary factor. Molitor and Sampson<sup>36</sup> have extended this type of study to observations of the effect of large doses of the pure vitamin on the duration of nystagmus in normal rats and have observed no change.

#### VITAMIN B<sub>1</sub> AND METABOLISM

There is a wealth of evidence showing that vitamin B<sub>1</sub> has some role in the metabolic processes of the body. It has been shown by several investigators<sup>36</sup> that in the state of heightened metabolism, such as is produced experimentally by administration of thyroid, the organism's need for this dietary essential is increased. Such

27. Shimazono J. B<sub>1</sub>-Avitaminosis und Beriberi. *Ergebn. d. inn. Med. u. Kinderh.* **59**, 1 (1931).

28. Aalsmeer W. C. and Wenckebach K. F. *Herz und Kreislauf bei der Beriberi-Krankheit*. Berlin: Urban & Schwarzenberg, 1928.

29. Molitor C. R., Straus M. B. and Cribb Stanley. *Alcoholic Neuritis: Dietary Deficiency as a Factor in Its Production*. New England J. Med. **205**, 1244-1249 (June 15) 1933. Jolliffe Norman and Joffe P. M. *Relation of Vitamin B<sub>1</sub> Intake to Neurological Changes in the Alcohol Addict*. *Proc. Soc. Exper. Biol. & Med.* **32**, 1161-1162 (April) 1935.

30. Jolliffe Norman, Colbert C. A. and Joffe P. M. *Observations on the Etiological Relation of Vitamin B<sub>1</sub> to Polyneuritis in the Alcohol Addict*. *Am. J. Med. Sc.* **191**, 515-527 (April) 1936.

31. Hiss F. D. and Mengert W. F. *Gestational Polyneuritis*. *J. A. M. A.* **101**, 2020-2022 (Dec. 25) 1933. Straus M. B. and MacDonald W. I. *Polyneuritis of Pregnancy: a Dietary Deficiency Disorder*. *J. A. M. A.* **100**, 13-01325 (April 29) 1933.

32. Wilbur D. J. and Snell A. M. *Deficiency States Associated with Gastrointestinal Disorders*. *Am. J. Gastroenterol.* A. to be published.

33. Fout P. J., Kempf G. F., Greene J. A. and Zerfas L. C. *Vitamin B<sub>1</sub> Intravenously for Treatment of Neurological Changes in Pernicious Anemia*. *J. Indiana M. A.* **25**, 448-451 (Oct.) 1932.

34. Gillet E. F., Kattwinkel E. L. and Castle W. B. *Experimental Combined System Disease*. *New England J. Med.* **202**, 523-527 (March 13) 1930. Zimmerman H. M. and Burick Ethel. *Lesions of the Nervous System Resulting from Deficiency of the Vitamin B Complex*. *Arch. Path.* **13**, 207-232 (Feb.) 1932.

35. Church C. F. *Functional Studies of the Nervous System in Experimental Beriberi*. *Am. J. Physiol.* **111**, 660 (80) (April) 1935.

36. Suggested to the United States Pharmacopeia Vitamin Conference Aug. 13, 1934.

37. Himwich H. F., Goldfarb Walter and Cowgill G. R. *Studies in the Physiology of Vitamins. VIII. The Effect of Thyroid Administration upon the Anorexia Characteristic of Lack of Undifferentiated Vitamin B*. *Am. J. Physiol.* **99**, 689-695 (Feb.) 1932. Cowgill G. R. and Palmieri M. J. *Studies in the Physiology of Vitamin. XVII. The Effect of Experimentally Induced Hyperthyroidism on the Vitamin B Requirement of Pigeons*. *Am. J. Physiol.* **105**, 146-150 (July) 1933. Sure Barnett and Smith Margaret E. *Hyperthyroidism and Nutrition*. *J. Vitamin B and Thyroxine*. *J. Nutrition* **7**, 547-555 (May) 1934.

experiments, of course, do not indicate precisely what chemical processes in the body involve this vitamin.

In his early work on this problem Funk<sup>37</sup> suggested that vitamin B<sub>1</sub> has some role in the metabolic transformation of carbohydrate in the organism. Numerous later investigators have inclined to this view. The problem has been studied in several ways. Experimental animals have been allowed to subsist on B<sub>1</sub>-deficient diets differing markedly in content of carbohydrate, protein and fat and the time required for development of the symptoms of B<sub>1</sub> deficiency taken as an indication of the relation of vitamin B<sub>1</sub> to the metabolism of one or more of these energy-yielding foodstuffs. There appears to be little doubt that a high carbohydrate diet is much more effective in producing the symptoms of B<sub>1</sub> avitaminosis than one high in fat. Out of this work has come considerable discussion of the vitamin B<sub>1</sub>-sparing action of fat. A recent example of this kind of research is seen in the paper by Westenbrink<sup>38</sup> in which it is reported that pigeons on a high carbohydrate diet devoid of fat had typical symptoms of B<sub>1</sub> deficiency in nineteen ( $\pm 4$ ) days, whereas another group subsisting on a high fat, carbohydrate-free ration required twenty-seven ( $\pm 7$ ) days for the symptoms to appear.

Kemmerer and Steenbock<sup>39</sup> endeavored to answer experimentally the question whether this B<sub>1</sub>-sparing action of fat is due to a greater conservation of the vitamin in the tissues. Various tissues of animals subsisting on suitable experimental rations were examined for their content of the vitamin. It was found that, when a diet low in vitamin B<sub>1</sub> and high in fat was fed, the tissues did not contain any more vitamin than when a diet low in vitamin and also low in fat was used. From such results it would appear that one cannot explain the vitamin B<sub>1</sub>-sparing action of fat on the basis of greater conservation of the store in the tissue of this dietary essential.

Evans and his associates<sup>40</sup> were able to list various natural fats according to their ability to spare vitamin B<sub>1</sub> and offered the suggestion that the chemical nature of the fat in some way influences its action in this regard. This idea has received considerable support from the recent work of Salmon and Goodman.<sup>41</sup> Like Evans and his co-workers, these investigators found that coconut fat is the most effective natural fat of those tested. More striking, however, was the observation that spastic experimental beriberi in the rat can be cured by the feeding of glyceryl caprylate or caproate. 'The effectiveness of esters of single fatty acids in alleviating the symptoms of vitamin B<sub>1</sub> deficiency in rats depended upon the length of the carbon chain of the fatty acid. The effectiveness was maximum at the 8-carbon acid and decreased in each direction from this point.' When fats and single acid esters were given with a B<sub>1</sub>-deficient diet, the apparent nutritive value was not the same as when the diet contained adequate amounts of the vitamin.

The studies along this line appear to justify the conclusion that the function of vitamin B<sub>1</sub> is more likely related to carbohydrate than to fat metabolism, but

the exact nature of the relationship is not evident and probably cannot be revealed by this type of experimentation. Westenbrink<sup>38</sup> has suggested three possible explanations. 1. When fat is fed, the organism uses in its metabolism less vitamin B<sub>1</sub> than it does when carbohydrate is fed. This is the view favored by Evans and his associates. 2. Whether the diet is high carbohydrate or high fat, the vitamin is used at the same rate, but the presence of much fat in some unknown manner affects the time of onset of the polyneuritis. 3. Under the two sets of dietary conditions vitamin B<sub>1</sub> is used at the same rate, but when carbohydrate is metabolized a toxic metabolite arises which in the absence of the vitamin is not removed and which therefore induces the polyneuritis. It will be seen that the last hypothesis constitutes a revival of the old toxin theory, with the toxin arising as a result of a "perverted intermediary metabolism" of carbohydrates.

The search for a specific function for vitamin B<sub>1</sub> has led many investigators to study the ability of various tissues from B<sub>1</sub>-deficient animals to utilize oxygen or to perform certain chemical transformations which normal tissues have been shown capable of producing and which, presumably, are normal processes of intermediary metabolism. Crystallizing out of extensive investigations of this type has come the theory of Peters and his associates that vitamin B<sub>1</sub> functions as a co-enzyme in the metabolism of carbohydrate, more specifically in the oxidative breakdown of pyruvic acid. For a summary of the work leading to this conclusion the reader should consult the paper by Peters.<sup>42</sup> From the foregoing statements it is evident that two of the earlier ideas concerning the function of vitamin B<sub>1</sub> are supported by this theory, those relating the vitamin to carbohydrate metabolism and to biologic oxidative mechanisms.

It has long been known that lactic acid is a normal intermediate metabolite in the metabolic breakdown of dextrose. Evidence has also been available in support of the view that the lactic acid loses hydrogen under the influence of a lactate dehydrogenase with the result that the three carbon atom ketonic acid, pyruvic acid, is produced. Peters and his associates have been able to secure evidence that the cells of certain parts of the brain of the B<sub>1</sub>-deficient pigeon show a lowered respiration in the presence of dextrose, a condition remedied by the addition of pure vitamin B<sub>1</sub>. This action of the vitamin, on analysis, proves to be definitely that of a catalyst. Further, analysis reveals that these B<sub>1</sub>-deficient cells, when respiring in the presence of added lactate without vitamin B<sub>1</sub>, show an increase of pyruvate, and this increase is reduced if the vitamin is added to the *in vitro* system. Evidently, then, vitamin B<sub>1</sub> has some part in causing the disappearance of pyruvate. Study of the ratio of the extra oxygen taken up to the pyruvic acid disappearing on addition of the vitamin has revealed a value close to that yielded by the cells of normal brain tissue. On such results as these rests the contention that vitamin B<sub>1</sub> functions in some way to bring about oxidation of pyruvic acid. If this is correct it is obvious that in association with vitamin B<sub>1</sub> deficiency there should be an accumulation of pyruvic acid in the blood, and quantitative examination of this fluid for pyruvate might be made the basis of a bio-

<sup>37</sup> Funk C. A. *Studien über Beriberi. VI. Die Rolle der Vitamine beim Kohlenhydratstoffwechsel.* Ztschr. f. physiol. Chem. **80**: 376-380, 1917.

<sup>38</sup> Westenbrink H. G. K. *Vitamin B Sparing Action of Fat.* Acta brev. Neerland. **3**: 9, 1933. abstr. Chem. Abstr. **28**: 7319, 1934.

<sup>39</sup> Kemmerer A. R. and Steenbock Harry. *A Study of the Sparing Action of Fats on the Vitamin B Content of Animal Tissues.* J. Biol. Chem. **103**: 3362 (Dec.) 1933.

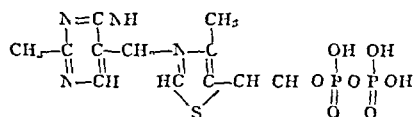
<sup>40</sup> Evans H. M., Lepkovsky Samuel and Murphy Elizabeth A. *The Sparing Action of Fat on Vitamin B. VII. The Effectiveness of Various Natural Fats in Sparing Vitamin B.* J. Biol. Chem. **107**: 429, 437 (Nov.) 1934.

<sup>41</sup> Westenbrink H. G. K. *Ueber den Einfluss der Menge und der Zusammenstellung der Ernährung auf die Folgen von Vitamin B<sub>1</sub> Mangel.* Arch. neerl. de physiol. **10**: 94-115, 1933.

<sup>42</sup> Peters R. A. *The Biochemical Lesion in Vitamin B<sub>1</sub> Deficiency.* Lancet **1**: 1161 (May 23) 1936.

chemical method for detection of a state of vitamin B<sub>1</sub> deficiency. Platt and Lu,<sup>43</sup> among others, have tested this idea in cases of beriberi and observed definite increases of bisulfite-binding substances (pyruvic acid chiefly) in the blood, urine and cerebrospinal fluid. The validity of this test for B<sub>1</sub> deficiency obviously depends in considerable degree on the specificity of the production of pyruvate, if it can occur in association with other conditions besides vitamin B<sub>1</sub> deficiency its value is lessened to that extent. The observations made in cases of other disease conditions by Johnson, Meiklejohn, Passmore and Thompson<sup>44</sup> favor the view that the accumulation of pyruvate in the blood, urine and cerebrospinal fluid is reasonably specific for vitamin B<sub>1</sub> deficiency. This conclusion receives further support in the work of Thompson and Johnson,<sup>45</sup> who found the blood of B<sub>1</sub>-deficient pigeons and rats to contain abnormally large amounts of bisulfite-binding substances, probably entirely pyruvic acid, in cured animals the concentration of these substances in the blood was reduced to that found in the normal organism.

It would take me too far afield to discuss carbohydrate metabolism in all its details. Let it suffice to consider the problem of the breakdown of pyruvic acid as it may be affected by vitamin B<sub>1</sub>. Two mechanisms may be mentioned, one involving simple decarboxylation with formation of acetaldehyde and carbon dioxide and the other involving oxidation with the production of acetic acid and carbon dioxide. The first type of reaction may be brought about through the action of the enzyme carboxylase in yeast, the second chemical change occurs in the presence of a pyruvic acid oxidase. Lohmann and Schuster<sup>46</sup> have reported the successful isolation in pure form of the natural cocarboxylase from bottom yeast and the finding that it is essentially a diphosphoric ester of vitamin B<sub>1</sub>. It is with particular interest therefore that the student of this problem reads the report of Stern and Hofer<sup>47</sup> of the synthesis of cocarboxylase from pure vitamin B<sub>1</sub>, which synthesis has been confirmed by Lohmann,<sup>48</sup> who, by using pyrophosphorylchloride instead of the phosphorus oxychloride employed by Stern and Hofer, obtained much higher yields. By the work of Tauber<sup>49</sup> and Lulei and Vestm<sup>50</sup> it has been shown that cocarboxylase can be produced also by enzymic synthesis. The formula of this compound, according to Lohmann, is given herewith:



Formula for cocarboxylase according to Lohmann

There are many reasons for believing that the breakdown of pyruvic acid by decarboxylation is common in plant metabolism, whether it also occurs to a large

extent in animal metabolism may be questioned. It is believed by many students of this subject that the second type of breakdown mentioned namely, oxidation with production of acetic acid and carbon dioxide, is more likely in the animal organism. If vitamin B<sub>1</sub> assists in this reaction it functions also as a co-oxidase in the oxidation of pyruvic acid. Lipmann<sup>51</sup> has reported that such an action is exerted by Lohmann's pure cocarboxylase. Thus it appears that vitamin B<sub>1</sub>, after phosphorylation in tissues to form a pyrophosphoric ester, can act as a coferment, assisting either the pyruvic acid carboxylase or its oxidase in breaking down this metabolite. Lipmann<sup>51</sup> suggested that one now has an explanation of the *in vitro* experiments of Peters, in which it appeared that after the addition of vitamin B<sub>1</sub> to the brain tissue a substance  $\alpha$  was converted into  $\gamma$ ,  $\gamma$  being the true activator of pyruvic acid oxidation. It is suggested that the  $\alpha$  of Peters is vitamin B<sub>1</sub> itself and the  $\gamma$  the vitamin pyrophosphate into which it is converted by the tissue.<sup>52</sup>

In the discussion of the vitamin B<sub>1</sub>-sparing action of fat, reference was made to Westenbrink's suggestion of the possibility that a toxic intermediary metabolite may be responsible for the pathologic changes characteristic of vitamin B<sub>1</sub> deficiency. In the light of the work just reviewed, calling attention to lactic and pyruvic acids as metabolites important in this connection, one might consider that one or the other or both of these acids can be toxic and therefore accumulation beyond a certain point be productive of injury to tissues. However, it has not been possible to induce symptoms by injections of lactate<sup>53</sup>. Therefore, there is little support for the view that lactic acid is the hypothetical toxic metabolite. With respect to pyruvic acid the amounts present in the blood even under conditions of accumulation have proved to be small. It is unlikely therefore that this substance can be the seached-for toxin. Peters preferred to attribute to the deficiency of vitamin an inability of cells to develop from carbohydrate sufficient energy for normal cell processes, with a resultant failure of important functions, the precise nature of the functional derangement depending on the cells involved. According to this idea it is unnecessary to postulate the presence of a toxic metabolite.

It will be noticed that this role in carbohydrate metabolism gives vitamin B<sub>1</sub> presumably a more or less generalized function in the body, instead of one peculiar to a given organ or group of cells. Also vitamin B<sub>1</sub> is placed in the category of substances involved in biologic oxidations and reductions, a group already containing numerous compounds. In view of this it may not be amiss to suggest the wisdom of suspending final judgment for the time being with respect to the universal character of the function of vitamin B<sub>1</sub> in all cells. May it not be that in some cells of the body the breakdown of pyruvic acid is accomplished by mechanisms other than the ones already demonstrated to involve vitamin B<sub>1</sub>?

#### PHARMACOLOGY OF VITAMIN B<sub>1</sub>

The isolation of vitamin B<sub>1</sub> and its synthesis have made possible the study of its pharmacologic action. Molitor and Sampson<sup>54</sup> have conducted such an investigation, some of the results of which have already

<sup>43</sup> Platt B. S. and Lu G. D. Chemical and Clinical Findings in Beriberi with Special Reference to Vitamin B<sub>1</sub> Deficiency. *Quart. J. Med.* 53: 375 (July) 1956.

<sup>44</sup> Johnson R. E., Meiklejohn A. P., Passmore Reginald and Thompson K. H. S. A Note on the Level of Carbonic Compounds in Human Blood. *Biochem. J.* 29: 2506-2509 1935.

<sup>45</sup> Thompson R. H. S. and Johnson R. E. Blood Pyruvate in Vitamin B<sub>1</sub> Deficiency. *Biochem. J.* 29: 694-700 1935.

<sup>46</sup> Lohmann K. and Schuster P. Ueber die Co-Carboxylase. *Naturwissenschaften* 25: 26 1937.

<sup>47</sup> Stern K. G. and Hofer I. W. Synthesis of Co-Carboxylase from Vitamin B<sub>1</sub>. *Science* 55: 483-484 (May 14) 1937. *Enzymologia* 3: 82-95 1937.

<sup>48</sup> Private communication to K. G. Stern.

<sup>49</sup> Tauber Henry. Enzymic Synthesis of Co-Carboxylase. *Science* 56: 180 (Aug. 20) 1937.

<sup>50</sup> Lulei H. V. and Vestm P. Enzymatische Synthese von Cocarboxylase mit Vitamin B<sub>1</sub> und Phosphat. *Naturwissenschaften* 25: 416 1937.

<sup>51</sup> Lipmann Fritz. Pyruvic Acid Dehydrogenation. Vitamin B<sub>1</sub> and Cocarboxylase. *Nature* 140: 25 (July 3) 1937.

<sup>52</sup> A more extended discussion of this subject was given by Williams R. R. The Chemistry of Thiamin (Vitamin B<sub>1</sub>). *J. A. M. A.* 110: 727 (March 5) 1938.

been cited. An additional conclusion of interest is that pure vitamin B<sub>12</sub> increases the oxygen consumption only in the B<sub>12</sub>-deficient animal. Relatively enormous doses are without effect in the normal organism. All the pharmacologic tests of this substance yielded essentially the same conclusion. Vitamin B<sub>12</sub> exerts a demonstrable action only in the B<sub>12</sub>-deficient animal. As no toxic symptoms of any kind were observed when doses approximating 25,000 or more times the estimated daily requirement were administered, it is evident that this dietary essential now available in pure form for clinical use is not to be regarded as a drug physiologically active within a certain range of dosage and dangerous to use when this range is exceeded. Instead, it is to be considered a normal and necessary part of the organism which exerts its function whenever it is needed, and any excess of supply beyond a modest amount capable of storage in the tissues for a relatively short period is eliminated through the kidneys. It is readily absorbed whether given by mouth or parenterally. With this vitamin now available in pure form and methods being perfected for its chemical determination, it is not unlikely that the future will soon see the abandonment of various "units" by which to express its activity, in favor of the use of definite dosages of the pure substance.

## REPORT ON POTENCY OF LIVER PRODUCTS

BY THE UNITED STATES PHARMACOPEIA ANTI-ANEMIA PREPARATIONS ADVISORY BOARD

The standardization of products for the treatment of pernicious anemia is defined for the first time by the Eleventh Revision of the United States Pharmacopeia as follows: "Liver, stomach and other preparations used for this purpose, to be recognized as meeting the specifications of this Pharmacopeia, must be approved by the 'U S P Anti-Anemia Preparations Advisory Board'. Approved products must have complied with the following specifications: 1. There shall have been submitted from time to time, as requested by the board, satisfactory clinical data from treatment, with the product in question, of cases of Addisonian pernicious anemia. 2. The clinical data submitted shall satisfy the U S P Anti-Anemia Preparations Advisory Board that the administration of the material in question, as prepared from liver or stomach, can produce a satisfactory result in the dose given."

In accordance with this requirement, the U S P Anti-Anemia Preparations Advisory Board has considered data submitted by various pharmaceutical companies. In each case the response of the patient to the liver extract in question was studied particularly with respect to the reticulocyte and red blood cell production resulting from the daily administration of a uniform amount of each preparation. The nature of the preparations submitted has been either dry liver extract (*extractum hepatis*), liquid extract of liver, (*liquor hepatis*) or parenteral solution of liver, (*liquor hepatis purificatus*) as defined in the Pharmacopeia of the United States, Eleventh Revision.

Because of the variation in the efficiency of different processes of manufacture, the therapeutic activity of the final product does not necessarily correspond to the amount of liver from which it is derived. It is therefore necessary to define the therapeutic activity of the

final product in other terms. Accordingly, the board has assigned to each acceptable preparation a value in terms of units. The amount of material constituting a "unit" is considered to be that amount of material which, when given daily to patients with pernicious anemia, has produced a satisfactory hematopoietic response. Since in the average case material derived from about thirty times as much liver must be given by mouth to produce the same response as when given by injection, it has been necessary to define the "unit" either as an "oral" unit or as an "injectable" unit, according to the intended method of administration of each preparation.

Accordingly, it is understood that on labels, bottles or cartons, or in advertising circulars, the manufacturer whose products have been assigned unitage by the board shall no longer state the number of grams of liver employed in making the preparation but merely either the number of cubic centimeters or grams of material constituting a unit. Depending on the method to be used in the administration of the preparation, the unit will be defined as either an "oral" unit or an "injectable" unit. Definition of the number of units in a preparation for "oral" administration in terms of "injectable" units or vice versa is not permitted. It is further understood that, if any dosage is suggested by the manufacturer, the dosage recommended should not be less than one unit a day, whether given daily or at longer intervals. The wording on the label or in the package literature concerning the unitage will give the following information: "The daily <sup>oral</sup> intramuscular administration of — (no) <sup>grams</sup> (capsules, teaspoons, etc) of material prepared by the method employed in producing the contents of this <sup>bottle</sup> <sup>vial</sup> <sup>package</sup> has been demonstrated to produce a satisfactory hematopoietic response in pernicious anemia, and constitutes a unit according to the United States Pharmacopeia Anti-Anemia Preparations Advisory Board."

In general it is recommended that, without good evidence that no harm will result, the amount of material administered should probably not be less than one unit a day, whether given daily or in multiple amounts at longer intervals. In many instances it is probable that the clinical indications will render it advisable to give the patient much more than a dosage averaging a unit a day. It must be recognized that the amount of material constituting a unit is determined largely on the basis of the hematopoietic response and does not imply that such an amount is necessarily effective in the control of gastro-intestinal or neural manifestations. Furthermore, there is some evidence that the effectiveness of different types of preparations, although similar when defined in terms of units with respect to blood formation, may differ in their effectiveness on the gastro-intestinal or neural manifestations. A full discussion of the indications for the administration of liver preparations is obviously outside the scope of this announcement, and through the cooperation of the American Medical Association and the Committee of the Revision of the United States Pharmacopeia, a special article on this subject has been published: "The Use of Drugs in the Treatment of Anemia" (*THE JOURNAL*, Nov. 14, 1936, p. 1633).

The board will, as occasion arises, reevaluate products based on new clinical data or assign unitage to new products submitted by manufacturers and accepted by the board.



## Council on Pharmacy and Chemistry

### PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
PRELIMINARY REPORT PAUL NICHOLAS LEECH Secretary

#### ALLANTOIN

Recently surgical maggots were omitted from New and Non-official Remedies at the request of the manufacturer. Presumably, this was related to the fact that the therapeutic use of the maggots had been superseded by the use of allantoin. In 1935 one brand of allantoin was submitted to the Council at the request of an author who wished to have his article, concerning its therapeutic use, published in *THE JOURNAL*. However, the manufacturer (Merck & Company) stated that it was not prepared to present the product formally at that time and to date has not submitted a complete presentation.

Subsequently the National Drug Company presented its brand of allantoin in several dosage forms. More recently the firm has forwarded additional evidence consisting of summaries of letters from physicians as well as photostatic copies of some of these letters, which are similar to testimonials. The material presented is considered later in the report.

Although it had been observed for many years, and especially in war time, that wounds which had become infected with maggots healed rapidly, Baer<sup>1</sup> was the first to apply maggots deliberately for the purpose of speeding the repair and healing of chronic suppurative infections. Robinson<sup>2</sup> referred to the reports of Baer,<sup>1</sup> Buchman<sup>3</sup> and Myers<sup>4</sup> as well as to his own work<sup>5</sup> and mentioned the many theories that had been advanced in explanation of the healing activity of maggots. It was generally presumed that the effective agent is a substance secreted by the maggots. Robinson studied the problem and described the many helpful indications which led him to the conclusion that the effective agent is allantoin. Among these were the effect of macerated embryonic tissue on wounds, the fact that embryos possess a well developed allantois which contains allantoin, that maggots like most animals probably excrete end products of purine metabolism largely as allantoin, and that the production of allantoin through the disintegration of uric acid has been said to be accelerated in an alkaline medium such as exists in the intestine of maggots.

Following this line of reasoning, Robinson examined sterile and nonsterile maggot excretions and found that they contained allantoin. He then tested the effect of allantoin derived from other sources on chronic nonhealing wounds, including ulcers and burns. It was found to be an effective agent although in certain cases of osteomyelitis the rate of healing was not as rapid as when the maggots were used initially. Thus he believed it was to be expected, since maggots themselves not only excrete allantoin but also remove detritus and reduce the infection. Robinson, in a more recent report, described his isolation of a substance from maggots' excretions which had the property of stimulating healing in infected wounds. He identified it as allantoin and concluded that it was at least one of the more important factors contributing to the healing effects noted in maggot therapy. Robinson<sup>6</sup> presented an exhibit of this work at the 1936 Kansas City session of the American Medical Association.

Although the substance appeared to be something less than maggot therapy as far as its effectiveness was concerned, Robinson noted that allantoin was bland, stable, harmless, had no odor and was nonirritating. He considered it quite inexpensive and described the methods for preparing it for use and applying it to the wound.

Allantoin is not a new remedy. Macalister in 1912 noted the use of comfrey root by the natives of rural England. They applied it to wounds for the purpose of promoting healing. Macalister applied the agent experimentally and also had it chemically analyzed. He used a rather strong infusion of the comfrey root in the successful treatment of an extensive rodent ulcer of the chest which under all other methods had continued to grow more extensive. The chemical analysis which he had made resulted in the determination of the fact that the substance contained from 0.8 to 0.9 per cent of allantoin. He noted that the people of England had used the comfrey root for many centuries, but no mention was made of it in any pharmacopeia which was available to him, nor did it appear to have ever been an official drug anywhere in the world. Subsequently it has been recognized and is described in the British Pharmaceutical Codex under the name *Symphytum* with the synonym comfrey root. It is stated to be the dried rhizome and root of *Symphytum officinale* (Boraginaceae). It is stated to contain from 0.6 to 0.8 per cent of allantoin. Further, allantoin itself is a British Pharmaceutical Codex item and both preparations are described as cell proliferants in Martindale's *Extra Pharmacopoeia*.

Bethune<sup>7</sup> noted the work of Macalister<sup>8</sup> and of Robinson<sup>9</sup> and studied the use of maggots and allantoin in certain tuberculous and nontuberculous suppurative lesions of the lung and pleura. Bethune pointed out the advantages of allantoin over maggot therapy but did not use it extensively in this series of cases. On the basis of the work done by Robinson and of subsequent clinical studies which are few and far between<sup>10</sup> it would seem that allantoin might easily replace maggot therapy. While it may not be quite as effective an agent, the convenience, inexpensiveness and ease with which it is administered to a wound gives it a great many advantages over the use of maggots. Patients have been known to object to maggot therapy not only because of the nature of the fly but also because of its activity when placed on a wound. The question of always being certain that the surgical maggots have been properly prepared for the use in wounds and the necessity of insuring against such diseases as tetanus in the use of maggots becomes unnecessary.

About the time allantoin was being prepared for the pharmaceutical market, Robinson<sup>11</sup> carried his experimentation one step further and reported that a constituent derived from allantoin was probably responsible for its effectiveness. The product is urea and it is even less expensive than allantoin. Robinson reported a series of fourteen cases and found that urea was capable of stimulating healing in chronic purulent wounds and that there was a resultant cleansing of the wound by removal of necrotic material and pyogenic bacteria. He believes that this healing action probably accounts, in part, for the custom prevalent in the old world of using urine for the healing of wounds. Urea, which is manufactured in enormous quantities, is readily available.

An article appearing in *THE JOURNAL*, April 3, 1937, by Holder and MacKay<sup>12</sup> notes that Symmers and Kirk<sup>13</sup> more than twenty years ago used urea solutions in the dressing of wounds with excellent results, that Millar<sup>14</sup> used it later in sup-

1 Baer W S Sacro Iliac Joint Arthritis Deformans. Viable Anti-septic in Chronic Osteomyelitis. Proc Internat Assembly Inter State Post Grad W A North America (1929) 5:371 1930 The Treatment of Chronic Osteomyelitis with the Maggot (Larva of the Blow Fly) J Bone & Joint Surg 13:438 (July) 1931

2 Robinson William Stimulation of Healing in Nonhealing Wounds by Allantoin Occurring in Maggot Secretions and of Wide Biological Distribution J Bone & Joint Surg 17:267 (April) 1935

3 Buchman Joseph and Blair J E Maggots and Their Use in the Treatment of Chronic Osteomyelitis Surg Gynecol & Obst 55:177 (Aug) 1932 Buchman Joseph The Rationale of the Treatment of Chronic Osteomyelitis with Special Reference to Maggot Therapy Ann Surg 99:251 (Feb) 1934

4 Myers Jacob and Czaja L M The Maggot Treatment of Osteomyelitis Illinois M J 60:124 (Aug) 1931

5 Kohin on William and Norwood A H The Role of Surgical Maggots in the Disinfection of Osteomyelitis and Other Infected Wound J Bone & Joint Surg 15:409 (April) 1933 Robinson William Literature Relating to the Use of Maggots in the Treatment of Suppurative Infections United States Department of Agriculture Bureau of Entomology Circular F 310 (Rev'd) June 1934

6 Kohin on William Allantoin a Constituent of Maggot Excretions Stimulates Healing of Chronic Discharging Wounds J Parasitol 21:354 (Oct) 1935

7 Bethune Norman Maggot and Allantoin Therapy in Tuberculous and Nontuberculous Suppurative Lesions of the Lung and Pleura J Thoracic Surg 5:322 (Feb) 1936

8 Macalister Charles A New Cell Proliferant Its Clinical Application in the Treatment of Ulcers Boston M & S J 1:10 1912

9 Robinson (footnotes 2 and 6) Bethune<sup>7</sup> Macalister<sup>8</sup>

10 Lotheringham W Tejerina and Gurruchaga Juan V La alantoina como estimulante de la reparacion Bol y trab de la Soc de cir de Buenos Aires 20:410 (June 17) 1936 La alantoina en la terapeutica del proceso de reparacion Rev med del Ro urdo 26:66 (Jan) 1936 Robinson (footnotes 2 and 6) Bethune<sup>7</sup> Macalister<sup>8</sup>

11 Robinson William Use of Urea to Stimulate Healing in Chronic Purulent Wounds Am J Surg 23:192 (Aug) 1936

12 Holder Hall G and MacKay Eaton M The Use of Urea in the Treatment of Infected Wounds J A M A 108:1167 (April 3) 1937

13 Symmers W S & C and Kirk T S Urea as a Bactericide and Its Application in the Treatment of Wounds Lancet 2:1237 1915

14 Millar W M Urea Crystals in Cancer J A M A 100:1634 (May 27) 1933





is not concerned with treatment. Senturia (*J Bone & Joint Surg* 16 119 [Jan] 1934) Sullivan and Hess (*ibid* p 185) and Wheelton and Mann (*ibid* 15 94 [Jan] 1933) recommend the use of another commercial colloidal sulfur. None of the papers that the Council's referee examined dealt with the preparation of the Drug Products Co., and it is stated in the firm's booklet that the soluble colloidal sulfur is an original product, not an imitation. It might be assumed that if colloidal sulfur were useful in the treatment of arthritis, this preparation would also be useful, but if "an original product means anything it means it is different from all others."

Since the therapeutic treatment of arthritis is highly specialized, the Council requested the assistance of a clinician who is engaged in a large hospital clinic devoted mainly to the study of arthritis. The consultant gave the following opinion:

Colloidal sulfur as well as several other drugs has been advocated during many years of the last several decades for the cure of arthritic conditions. None of them to date have become established. The reports concerning the use of colloidal sulfur in arthritis in the opinion of your consultant are inadequate. It is significant that the larger recognized clinics have not reported on the use of this preparation. As far as the consultant can find none of the authors reporting on colloidal sulfur have used adequate criteria of improvement noted in patients. In the consultant's opinion the value of colloidal sulfur in the treatment of arthritis has not to date been established.

Another specialist in the study of arthritis expressed to the Council's referee verbally a view in harmony with that just stated.

The Council declared Hyposols Sulisocol not acceptable for New and Nonofficial Remedies because of lack of evidence of its therapeutic value (conflict with rule 6), since such products have been in use for many years without having their therapeutic value recognized by the leaders in medicine who are concerned with the treatment of arthritis.

When the foregoing report was submitted to the firm in accordance with the Council's custom, a lengthy correspondence ensued. The firm, however, submitted no argument or evidence to change the Council's decision as to the unacceptability of the product. The firm implied that there was misrepresentation in the statement that Dr. Senturia did not use Sulisocol. In the paper referred to (published in 1934) Dr. Senturia definitely states that he used a certain other colloidal sulfur preparation. From correspondence with the firm and with Dr. Senturia it appears that the latter arranged to use Sulisocol in the summer of 1936, but no report on such work had been submitted to the Council. The product is meanwhile being actively promoted, and the Council felt obliged to publish its report for the information of the medical profession.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS ELICH, Secretary

**SULFANILAMIDE** (See Revised Supplement to New and Nonofficial Remedies, 1937, p 27)

**Sulfanilamide-Abbott**—A brand of sulfanilamide N N R. Manufactured by the Abbott Laboratories, North Chicago, Ill. No U S patent or trademark.  
Sulfanilamide Tablets 5 grains  
Sulfanilamide Tablets 1/2 grains

**METRAZOL** (See New and Nonofficial Remedies, 1937, p 301)

The following dosage form has been accepted:

Metraol Steril Aqueous Solution 10 per cent. A sterile aqueous solution containing metrazol 0.1 (m) per cubic centimeter for parenteral injection.

**PROCAINE HYDROCHLORIDE-SQUIBB** (See New and Nonofficial Remedies, 1937, p 70)

The following dosage form has been accepted:

Inject. Steril. Solution Procaine Hydrochloride Squibb 10 per cent. 2 cc. Each cubic centimeter contains procaine hydrochloride U S P 0.1 (m) in sterile distilled water.  
Manufactured by F. K. Squibb & Sons, New York. No U S patent or trademark.

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary

### GARTH BRAND GRAPEFRUIT JUICE SWEETENED AND UNSWEETENED

**Manufacturer**—Tyrrell and Garth, Houston, Texas

**Description**—Canned grapefruit juice (1) unsweetened and (2) with added sucrose, retaining in high degree the natural vitamin C content.

**Manufacture**—Carefully inspected grapefruit is thoroughly cleaned, again inspected, cut in half, and reamed. The resulting juice is strained, tested for sugar with the Brix hydrometer and if sufficiently concentrated (approximately 11° Brix), is pasteurized, automatically filled into cans, and sealed. If the strained juice does not contain the desired amount of sugar, sucrose is added and the juice is then pasteurized, filled into cans and sealed.

**Analysis** (submitted by manufacturer)—(1) Unsweetened moisture 90.1%, total solids 9.9%, ash 0.32%, fat (ether extract) 0.1%, protein (N  $\times$  6.25) 0.5%, sucrose 2.0%, invert sugar 6.7%, crude fiber 0.03%, carbohydrate other than crude fiber (by difference) 8.9%. (2) With added sucrose moisture 89.2%, total solids 10.8%, ash 0.31%, fat (ether extract) 0.1%, protein (N  $\times$  6.25) 0.5%, sucrose 2.1%, invert sugar 7.4%, crude fiber 0.03%, carbohydrate other than crude fiber (by difference) 9.9%.

**Calories**—0.4 per gram, 11 per ounce

**Vitamin**—As determined by chemical titration with 2,6-dichlorophenolindophenol the sweetened juice contains 0.29 mg. of vitamin C per cubic centimeter and the unsweetened juice 0.32 mg. per cubic centimeter. Both juices therefore contain approximately 600 International units of vitamin C per hundred cubic centimeters, 180 International units of vitamin C per fluidounce.

### MAYTIME BRAND EVAPORATED MILK

**Manufacturer**—Dairy Belt Milk Products Company (also known as Dairy Belt Cheese and Butter Company), Spencer, Wis.

**Description**—Unsweetened, sterilized evaporated milk.

**Manufacture**—Milk from company inspected farms is tested, preheated, evaporated under vacuum, homogenized, cooled, filled into cans, sealed and sterilized.

**Analysis** (submitted by manufacturer)—Moisture 73.8%, total solids 26.2%, ash 1.5%, fat (ether extract) 8.0%, protein (N  $\times$  6.25) 6.5%, lactose (by difference) 10.2%.

**Calories**—1.4 per gram, 40 per ounce

### SEXTON BRAND LIMA BEANS, WATER PACKED

**Manufacturer**—John Sexton & Company, Chicago

**Description**—Canned lima beans, packed in water.

**Manufacture**—Lima bean vines are thrashed, beans mechanically cleaned and hand sorted. White beans discarded. Green beans graded, blanched, washed, inspected, mechanically filled into cans, hot water added, sealed and processed.

**Analysis** (submitted by manufacturer)—(Analysis of entire content including liquid) moisture 82.1%, total solids 17.9%, ash 0.79%, fat (ether extract) 0.4%, protein (N  $\times$  6.25) 3.6%, crude fiber 1.26%, carbohydrates other than crude fiber (by difference) 11.8%.

**Calories**—0.65 per gram, 18 per ounce

**Claims of Manufacturer**—Choice quality lima beans packed in water without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

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SATURDAY, MARCH 12, 1938

## PLYLEPHLEBITIS COMPLICATING APPENDICITIS

Pylephlebitis as a cause of mortality in acute appendicitis receives but scant mention in recent statistics. The severe pathologic conditions of the appendix and the surrounding structures, which constitute as a rule the necessary antecedents for thrombotic infection of the portal vein, are seldom observed in the early operations for acute appendicitis which are the rule today. Because of the generally fatal character of this complication if left untreated, it should not, however, be entirely disregarded in considering the mortality of acute appendicitis.

The postmortem statistics of the earlier investigators (Fitz, Armstrong) indicate that the incidence of pylephlebitis and liver abscess in patients who died from appendicitis varied from 3 to 5 per cent. According to Colp,<sup>1</sup> among 2,841 patients admitted to Mount Sinai Hospital of New York between 1916 and 1925 the diagnosis of pylephlebitis of appendicular origin was made nine times (about 0.3 per cent). In a more recent study Hawkes<sup>2</sup> stated that among 1,463 consecutive cases of all types of appendicitis covering a ten year period at the Newark City Hospital there were twelve cases with four deaths.

The thrombosis begins in the small veins of the mesentery of the appendix and extends by continuity into the ileocolic vein, which in turn communicates with the superior mesenteric, one of the main branches of the portal vein. The infected thrombi thus gain the intrahepatic radicles and cause multiple liver abscesses. Embolic transport of infected thrombi from the small radicles of the portal system may reach the liver without necessarily involving the larger venous trunks. The accompanying pathologic appearance includes, as a rule, an acutely inflamed, frequently gangrenous appendix with a much thickened, friable mesenteric omentum, edema of the retroperitoneal tissues, a localized abscess and more or less extensive peritonitis.

The symptoms of pylephlebitis were clearly understood and well described by pioneer workers. Thus Deaver wrote in 1909 "The pylephlebitis is sometimes of the mild or noninfectious variety, frequently, however, the process is infectious, the thrombus becomes purulent and leads first to abscess of the liver and subsequently to general infection with pyemia. Chills are a rather uncommon occurrence in appendicitis, yet if at the onset of the attack they occur in rapid succession and are accompanied by temperature they indicate a rapidly developing gangrene of the appendix. Chills occurring on the second or third day of the attack and associated with a high fever usually indicate the development of metastatic or embolic abscesses." Kelly states that "chills are exceptional in cases of simple diffuse inflammation but are not rare with severe lesions. Of the patients with acute appendicitis not associated with abscesses or general peritonitis admitted to Johns Hopkins hospitals, 15 per cent gave a history of chills, and in all of these the appendix was gangrenous, perforated or distended with pus. Repeated chills occurring later in the course of the malady generally indicate a dissemination of the pyemic process."

The most significant symptom is the occurrence of chills followed by high temperature. Slight jaundice may develop and the liver may be enlarged and tender. There is irregular, severe abdominal pain, anorexia, signs of a profound toxemia, and death supervening in the course of two or three weeks. Thalhimer<sup>3</sup> emphasizes that a chill during an attack of appendicitis occurring before the operation is just as indicative of pylephlebitis as a postoperative chill. Blood cultures are as a rule negative. One of the functions of the liver is to destroy the bacteria brought to it by the portal vein. According to Thalhimer, the blood cultures will be positive only when the liver abscesses cause an infective thrombophlebitis of the branches of the hepatic veins. Bacteria then appear in the general circulation, for the lungs do not act as an efficient filter.

From a diagnostic point of view the occurrence of chills in the presence of symptoms and signs of acute appendicitis has often led to confusion and to delay of the operation, thus further minimizing the patient's chance of recovery. The early operation is undoubtedly the best prophylaxis against the occurrence of this grave complication. If all patients with acute appendicitis were operated on within the first twenty-four hours this complication would not be seen at all. Wilms<sup>4</sup> in 1907 was the first to intervene successfully in a case of postoperative pylephlebitis. Drawing an analogy from Trendelenburg's ligation of the ovarian vein in puerperal sepsis Wilms sought to prevent the extension of the thrombotic process by ligation of the veins.

<sup>1</sup> Colp, Ralph. Pylephlebitis of Appendicular Origin. *Surg. Gynec. & Obst.* 43: 627 (Nov.) 1926.

<sup>2</sup> Hawkes, S. Z. Thrombophlebitis of the Appendicular Vein Complicating Acute Appendicitis. *Surg. Gynec. & Obst.* 66: 62 (Jan.) 1938.

<sup>3</sup> Thalhimer, William. Chills Occurring Early in Appendicitis Before Operation and Their Indication of an Operable Stage of Pylephlebitis. *Arch. Surg.* 8: 658 (March) 1924.

<sup>4</sup> Wilms. Venenunterbindung bei eitriger Pfortaderthrombose nach Appendicitis. *Zentralbl. f. Chir.* July 24 1909 p. 1041.

of the ileocolic angle. The operative procedure consisted of freeing the cecum and the first coil of the ileum from the posterior parietal wall and incising the anterior leaf of the mesentery, thus exposing the vessels contained within it. The veins were ligated in two bundles, and two small arteries which were visualized were spared. The patient made an uneventful recovery. Further experiences with the Wilms operation demonstrated, however, that it was not nearly as efficient in preventing the extension of the thrombotic process as the ligation of the jugular vein in sinus thrombosis of otitic origin or the ligation of the ovarian vein in puerperal sepsis. The difference is due to the fact that in the diseases mentioned it is possible to ligate the main venous trunk representing the chief route for the transport of thrombi, while in the case of acute appendicitis it becomes necessary to ligate the small radicles in the vicinity of the disease focus before they form a venous trunk. The ligation for that reason is often done too late, the thrombi having extended beyond the point of ligation. A further disadvantage was the fact that ligation of the vessels close to the intestine caused nutritive disturbances in the intestinal wall. It therefore occurred to Braun<sup>5</sup> that the ligation should be performed at the junction of the ileocolic vein with the superior mesenteric. The veins of the mesenterium and of the cecum merge into a fairly large single trunk, the ileocolic vein. This is joined by the right colic vein from above, but otherwise the vein has no tributaries. The trunk is not difficult to recognize and it presents no difficulties in ligation. The course of the ileocolic vein follows an oblique line from the ileocecal angle upward and mediad directly beneath the anterior leaf of the mesocolon. It can be easily followed after incision of the peritoneal covering up to the junction with the superior mesenteric vein. According to Braun, the ileocolic vein is the principal if not the only path for the transport of thrombi in appendicitis. In four necropsies studied by Braun, the thrombi were found in the radicles of the ileocolic vein alone, the other branches of the superior mesenteric vein being free of thrombi. He therefore feels that timely ligation of the ileocolic vein close to its confluence with the superior mesenteric vein would have saved the lives of these patients. The advantages of Braun's operation over that of Wilms is that the former is easier to perform, that it obviates the necessity of freeing the cecum and the ascending colon from the posterior abdominal wall, and that ligation is performed farther from the disease focus. Braun successfully operated by this method in two cases. He concludes that ligation of the ileocolic vein is indicated in every case of acute or chronic appendicitis in which symptoms of septic thrombosis of the liver are present.

It is doubtful that surgical intervention can accomplish anything once the infectious thrombotic process

has passed beyond the junction of the ileocolic vein with the superior mesenteric. Neuhof's suggestion of the feasibility of gradual ligation of the portal vein is not likely to be accepted. Colp<sup>1</sup> reported three cases in which the portal vein and one in which the superior mesenteric were ligated. All four patients survived the shock of the operation but died of sepsis caused by liver abscess.

#### MAX BRODEL AND MEDICAL ILLUSTRATION

Since the time when the birth of one of Cleopatra's children was recorded in illustration on the wall of an Egyptian temple, medical art has aided an understanding of biologic and disease processes. The notebooks of Leonardo da Vinci indicate that, although an artist, he had as great a knowledge of anatomy as any other man of his time. The history of anatomic illustration shows a steady progress in the field since the middle ages. Indeed, it is sad to contemplate the day when the machine age, through its development of color photography, interior lighting of the human body and other similar methods, may relegate into obsolescence the personal craftsmanship of the biologic artist.

In 1894 Max Brodel came to Baltimore, after working on the anatomic illustrations of Spalteholz, His and Braune. The years from 1894 to 1910 saw him engaged chiefly in preparing illustrations for the works of Howard Kelly. In 1910 he became the presiding genius of a department of art as applied to medicine in the Johns Hopkins University School of Medicine. It was the only one of its kind in this country. This unique position it continues to occupy as testimony to the character of an inspired teacher. While great numbers of distinguished students have benefited from his instruction, some have been so conspicuous for their talent and skill that their names are already recognized throughout the medical world. Elizabeth Brodel of the Woman's Clinic in the New York Hospital, James F. Didusch of the Department of Embryology in the Carnegie Institution, Dorcas Hager, whose illustrations of Dr. Walter Dandy's notable surgery of the brain in Johns Hopkins University have done much to advance that difficult field, and Willard C. Shepard of Chicago are names of Brodel's distinguished pupils frequently encountered in the best medical literature of our day. His other distinguished pupils are found carrying the skill of their teacher from coast to coast. Among the institutions which have benefited by their contributions are the Wilmer, Brady, Mayo and Lahey clinics, the American Museum of Natural History, and Yale, Minnesota, Rochester, Toronto and Tulane universities.

And there are free lances who make it possible for individual physicians and investigators not connected with any formal institution to avail themselves of this type of masterful interpretation of conditions seen and procedures carried out in the laboratory and the clinic.

<sup>5</sup> Braun H. Die Unterbindung der Venen ileocolica bei mesenterischer Peritonie nach Appendicitis. Beitr. z. klin. Chir. 56: 114, 191.

What a triumph for Max Brodel—to cast his eye over our medical world and to see the impress that he has made on it

To list the innumerable books and periodicals which carry the contributions of Max Brodel and his pupils would be impossible. In some instances the Brodel pictures have been as potent as the author's description in extending a new concept to the medical profession. Could anything be more graphic than his colored illustration of Cullen's sign—that warning of abdominal hemorrhage—so perfectly portrayed as to fix itself indelibly in the mind of the medical reader, making prompt recognition of the condition possible and, no doubt, saving the lives of many people? Dr. George H. Simmons, an editor not much given to enthusiasm or raptures, used to glow in the contemplation of Max Brodel illustrations for a scientific paper that was not quite so good and accept the paper more for the pictures than for the value of the text.

The craftsmanship of Brodel and his pupils has done much to raise the standard of American medical publication. The Johns Hopkins University School of Medicine has been fortunate indeed in its professor of art in medicine, the faculty and the students have had the intimate advantage of his personal inspiration, the medical world appreciates the helpfulness of his graphic teaching. Elsewhere in this issue<sup>1</sup> appears a description of the presentation of his portrait to Johns Hopkins University School of Medicine. It is fitting that this portrait, from which there gazes forth the humor, the human kindness, the scientific spirit and the artistry of this great scholar, should hang in the halls of this noted university beside those other unique masters in the medical corridors of time—Osler, Halsted, Kelly and Welch.

## Current Comment

### ACCIDENTS IN 1937

In a press release from the National Safety Council, the toll of accidental deaths and injuries for 1937 has been given as dead 106,000, permanently injured 375,000 and temporarily injured 9,400,000. The estimated cost of this civil carnage was \$3,700,000,000. While the deaths from accidents of all causes decreased 4 per cent from 1936, traffic accidents increased 4 per cent, home accidents decreased 15 per cent, occupational accidents increased 6 per cent and public nontraffic accidents decreased 5 per cent. Although two major disasters occurred in 1937—the New London, Texas, school house explosion in which 294 children lost their lives, and the Hindenburg disaster, in which thirty-five passengers and members of the crew were killed—the total effect was relatively insignificant in comparison with the accidental deaths occurring singly or in twos. Falls again effected more accidental deaths than any other one cause except traffic accidents. The traffic death rate per hundred thousand of population in 1937

was 30.7, compared to 29.7 in 1936, and represents a rate 62 per cent higher than 1925 and 30 per cent higher than 1933. On a mileage basis, however, the motor vehicle death rate declined from 16.6 deaths per hundred million miles in 1936 to 15.9 in 1937. Of further slight encouragement is the fact that in 1937 twenty states cut their death toll from traffic accidents, and in all but one (based on ten months' information) this was accomplished in the face of increased highway traffic. Accompanying other significant figures is the information that fifty persons were killed in 1937 in accidents involving airplanes in scheduled domestic operations. In 1936 the total was sixty-one. Forty airplane passengers were killed, as compared with forty-four in 1936. Passenger miles flown in 1937 totaled 480,000,000, resulting in a passenger death rate of 8.3 per hundred million miles, or about half that from automobile traffic accidents on a passenger mileage basis.<sup>1</sup> The publicity accorded to the former throws into sharp relief the necessity for continued efforts on the still relatively unpublicized hazards of ground traffic.

### AID TO THE BLIND

Thirty-six states are now cooperating with the Social Security Board in granting financial assistance to the needy blind.<sup>1</sup> The state with the largest number of persons receiving such assistance in July 1937 was Pennsylvania, with 10,511 receiving aid. Maine, however, was rendering aid to 137 per hundred thousand of population, as compared with 104 per hundred thousand of population in Pennsylvania. New York's 18 per hundred thousand and North Carolina's 14 were at the other end of the scale. At the New York meeting of the Academy of Ophthalmology and Otolaryngology the Social Security Board informed the council of the academy of its attempt to set up a definition of blindness to be placed before the several state agencies administering the various blind assistance laws. It is based on the definition of economic blindness proposed by the American Medical Association in 1934 and differs but little from that definition. "In general, central visual acuity of 20/200 or less in the better eye with proper correction has been considered as economic blindness. An individual with central visual acuity of more than 20/200 in the better eye with proper correction is usually not considered blind, unless there is a field defect in which the peripheral field has contracted to such an extent that the widest diameter of the remaining visual field subtends an angular distance no greater than 20 degrees." So far, however, only four states have followed the recommendation of the council and the Social Security Board in fixing a definite value to the contracted visual fields for determining blindness. Naturally the medical determination of blindness is an important point in any state program of financial aid to the blind. The council of the academy in 1936 said, in reply to the question as to who should determine the fact of blindness: "They shall be certified ophthalmologists in a given state. Or in case

<sup>1</sup> Rice, C. E. Report to Committee of American Academy of Ophthalmology and Otolaryngology, U. S. Public Health Service.

a certified ophthalmologist is not available, then the state medical society should recommend a list of competent ophthalmologists in the state." At present only four states indicate that ophthalmologists are chosen by the state medical society. In one, the state health department chooses the examiners, in another, those listed in the American Medical Directory as practicing ophthalmologists or as eye, ear, nose and throat specialists are designated. Only one state (Maryland) has limited examiners to ophthalmologists certified by the American Board of Ophthalmology. Thirteen states have appointed supervising or consulting ophthalmologists. This variation is obviously unsatisfactory. In twenty-three of the thirty-six states there is a statutory provision that the state agency concerned with assistance to the blind (usually the state welfare board) can provide treatment for needy persons either for restoration of vision or to prevent blindness. In three additional states such provision is made through rule and regulation. A serious difficulty encountered is the confusion of terminology. The Committee on Statistics of the Blind, however, organized about 1930 at the instigation of the Census Bureau and under the auspices of the National Society for the Prevention of Blindness and the American Foundation for the Blind, has proposed a classification which has been submitted to the council of the American Academy of Ophthalmology for careful revision.

#### MULTIPLE ANTIGEN SENSITIVITY

Simultaneous hypersensitivity to more than one antigenic substance has been generally recognized. The toleration of one antigen without allergic manifestations has been considered a distinct probability. It has been assumed also, however, that the addition of a further specific excitant under these circumstances would lead to the production of allergic symptoms by way of a summation effect. In a recent attempt to test the validity of this hypothesis, Pratt<sup>1</sup> sensitized guinea pigs to two antigens in a uniform manner. Recrystallized egg albumin and horse serum globulin, both dissolved in physiologic solution of sodium chloride, were the substances given. One third were then shocked with a dosage of the first antigen which would produce an occasional anaphylactic death, one third with a similar dosage of the second antigen, and the last third with the two antigens, given simultaneously, in a dosage represented by the sum of the individual dosages given the first two groups. The degree of shock was classified from one to five plus. Seventy-three carefully selected guinea pigs were used in the experiments. The results were clear cut. If a guinea pig is specifically sensitive to two substances and is shocked with both he will react no more vigorously than he would to either one alone, provided the two antigens are equally capable of producing moderate shock. If, however, the dosage of either antigen is doubled, the animals respond with an enhanced degree of shock. The explanation for this phenomenon is not clear. It is possible, Pratt points out, that the body can react to

only one antigen at a time during the short period that an anaphylactic action is taking place. Another possible explanation is that the egg albumin molecule, with a much smaller molecular weight than the horse serum globulin, is capable of leaving the vascular bed and coming into contact with the sensitized cells more quickly. As pointed out in the discussion of this paper, if these conclusions apply to man a new idea will be introduced into the practice of allergy, namely, that summation of effects from combined sensitizations may not occur to the extent previously assumed. This possibility, however, is by no means certain in view of the probably more highly sensitive and reactive nature of the guinea pig.

### Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

#### ALABAMA

**Society News**—Dr. Andrew Richard Bliss Jr., Memphis, Tenn., discussed socialized medicine before the Walker County Medical Society in Jasper February 11.—Dr. Dowlen D. Cox, Sheffield, discussed diseases of the kidneys at a meeting of the Franklin County Medical Society in Russellville January 4.

**New District Health Unit**—The counties of Bullock, Chambers, Lee, Macon, Randolph, Russell and Tallapoosa have joined to form a new district health unit in eastern Alabama, with headquarters in Opelika. Dr. Arthur H. Graham is the medical director. According to the newspapers, the Rockefeller Foundation is cooperating with the state in supplying funds for the work, which will include a program for control of tuberculosis in an area without proper hospital facilities.

#### ARKANSAS

**New District Health Unit**—A new district health unit has been organized for Bradley, Cleveland and Lincoln counties, with headquarters in Warren, effective January 1. Dr. Jennings Bryan Ivy has been placed in charge.

**New Professor of Obstetrics**—Dr. Ernest H. White, associate professor of obstetrics and gynecology, University of Arkansas School of Medicine, Little Rock, has been appointed professor succeeding the late Dr. Shelby B. Hinkle. Dr. White graduated at the Harvard University Medical School in 1922 and for several years has been secretary of the Pulaski County Medical Society. He has been connected with the Arkansas school since 1923.

#### CALIFORNIA

**Personal**—The Distinguished Achievement Award of Phi Kappa Alpha was presented to Dr. John C. Ruddock, associate clinical professor of medicine, University of Southern California School of Medicine, Los Angeles, at the fraternity's seventieth anniversary dinner in Chicago March 1.—Dr. John B. Saunders, associate professor of anatomy, University of California Medical School, San Francisco, has been appointed an editor for *Isis*, quarterly journal of the International Society of the History of Science.

**Alumni Honor Memory of Dr. Kerr**—The annual alumni day program of the University of California Medical School, San Francisco, will be presented on March 22 by the William Watt Kerr Club in honor of the late Dr. Kerr, formerly professor of medicine. The morning session will be given over to clinics; speakers in the afternoon will include

Dr. Sidney Olsen, class of 1919, The Role of the Double Ureter  
Dr. Philip H. Arnot, class of 1920, Cesarean Section  
Dr. Irvin H. Betts, class of 1915, The Doctor in General Practice  
Dr. Hiram E. Miller, class of 1917, Chronic Granuloma of Industrial Origin

Dr. Langley Porter, dean of the medical school, will deliver the Alpha Omega Alpha Lecture to conclude the day's program.

<sup>1</sup> Pratt, H. N. Anaphylaxis in Multiple Sensitive Guinea Pigs. *Allergy* 9: 14 (Nov.) 1937.

## COLORADO

**Changes at the University of Colorado**—Recent changes at the University of Colorado School of Medicine, Denver, include the following

Dr Philip Work, to professor of neurology and head of the department  
Dr Constantine F Kemper, associate professor of medicine  
Dr Harry Gauss, assistant professor of medicine  
Dr Edward L Harvey, assistant professor of obstetrics and gynecology  
Dr Harold I Hickey, a assistant professor of otolaryngology

Howard J Shaughnessy, Ph D, former assistant professor of bacteriology and public health, University of Illinois College of Medicine, has been appointed associate professor of bacteriology and public health to fill the vacancy occasioned by the retirement of Severance Burrage, Ph D

## CONNECTICUT

**New Superintendent of New Haven Hospital**—James A Hamilton, superintendent of the Cleveland City Hospital, Cleveland, has been appointed superintendent of the New Haven Hospital, New Haven, effective September 1. He succeeds Albert W Buck, Ph D, who became head of the Charlotte Hungerford Hospital, Torrington, January 1. Mr Hamilton graduated from Dartmouth College in 1922 and obtained his master's degree in 1923 from the Tuck Business School. He was assistant professor of industrial management at Dartmouth from 1923 to 1936 and for ten years superintendent of the Mary Hitchcock Memorial Hospital at Hanover.

## FLORIDA

**Directory of Florida Physicians**—The publication of a medical directory for physicians licensed to practice medicine in Florida was approved by the executive committee of the state medical society at its meeting in Tampa in January. On February 8, in Jacksonville, the state board of health unanimously endorsed the directory and the state board of medical examiners has approved the project. It is hoped to have the directory in the mail before the state medical meeting in May. The first section will contain the names and addresses of the members of the state medical association by component societies, the second the names of physicians licensed to practice medicine in Florida by cities, the third an alphabetical list of physicians licensed to practice in the state. The use of certain type and symbols will show the status of the physician. The price of the first edition will be \$1.

## GEORGIA

**The Block Memorial Lecture**—Dr Israel S Wechsler, New York, delivered the fourth E Bates Block Memorial Lecture before the Fulton County Medical Society February 24, on "Abdominal Syndromes in Diseases of the Brain."

**New County Health Departments**—The state department of health announced in its January bulletin that health departments were to begin in several counties during January. Health commissioners have been appointed as follows:

Bleckley County, Dr Henry T Akins, Cochran  
Bulloch County, Dr Harry L McTye, Savannah  
Coffee County, Dr Roy L Johnson, Atlanta  
Dodge County, Dr Johnnie L Gallimore, Macon  
Walton County, Dr John L Dorrough, Monroe

Units will begin in Crisp and Monroe counties as soon as health commissioners can be secured, it was stated. Dr Rufus Floyd Payne, Tifton, has resigned as health commissioner of Tift County to become assistant director of county health work of the state department of public health. Dr Robert H Haralson Jr, Atlanta, will succeed him in Tift County.

## ILLINOIS

**Society News**—Dr Willis S Lemon, Rochester, Minn, will discuss "The Development and Metamorphosis of the Primary Tubercle" before the Peoria City Medical Society in Peoria March 15. The society was addressed March 1 by Dr Harry Culver, Chicago, on "Nonspecific Kidney Infections Including Their Surgical Complications."—The St. Clair County Medical Society was addressed in East St. Louis February 3 by Drs Robinson Bosworth, East St. Louis, and Robert C Farrier, Escanaba, Mich, on tuberculosis and public health, respectively.

## Chicago

**The Christian Fenger Lecture**—Dr David J Davis, dean and professor of pathology, University of Illinois College of Medicine, will deliver the second Christian Fenger Lecture of the Institute of Medicine and the Chicago Pathological Society at the Palmer House March 25. His subject will be "Pathology as a Basis for the Study of Health."

**The Gehrman Lectures**—Dr Thomas M Rivers, director, the Hospital of the Rockefeller Institute for Medical Research, New York, will deliver the Gehrman lectures of the University of Illinois College of Medicine, March 23-25. His subjects are "Viruses and Virus Diseases," "Cultivation of Vaccine Virus: Methods Employed, Types of Information Obtained, Jennerian Prophylaxis with Cultured Virus," and "Pohomyelitis."

**Joint Gynecologic Meeting**—The Chicago Gynecological Society and the St. Louis Gynecological Society held a joint session February 19. Clinics were held at the Chicago Lying In and Research and Educational hospitals. The following program was presented by members of the St. Louis society:

Dr William C Stude, Cesarean Section—An Analysis and a Discussion  
Dr Thomas K Brown, Results of Cultures of the Uterus at Cesarean Sections

Dr Melvin A Roblee, Etiology of Cervicitis

Carl G Hartman, Ph D, department of embryology, Carnegie Institution of Washington, Baltimore, delivered a lecture on "The Physiology and Control of Ovulation."

**Society News**—Dr Winthrop M Phelps, Baltimore, discussed "The Care and Treatment of Cerebral Spastic Paralysis" before a joint meeting of the Chicago Orthopedic Society and Chicago Pediatric Society February 11.—Dr Edward C Holmblad, regional chief surgeon, Railway Express Agency, addressed the Chicago Society of Industrial Medicine and Surgery February 14 on "Factors Determining Compensation from the Medical Viewpoint," and Mr Henry H Rolfe, past president, Casualty Adjusters Association, "Compensability of Injuries from a Legal Standpoint."—The Chicago Neurological Society was addressed February 17 by Drs Harold C Voris and Milton H Dresner on "Hodgkin's Disease of the Spine with Paraplegia, Complicated by Pregnancy," Harry A Paskind, Chicago, and Robert C Lonergan, Evanston, Ill, "Treatment of Myotonia Congenita with Quinine," Karl A Menninger, Topeka, Kan, "Emotional Factors in Hypertension," and Horace W Magoun, Ph D, "Activation of the Heat Loss Mechanism by Localized Heating of the Brain."

## IOWA

**Graduate Courses**—The speakers' bureau of the state medical society will conduct five graduate courses this spring in Council Bluffs, Rockwell City, Clinton, Iowa City and Marshalltown. The course in Marshalltown began February 1 to continue on a monthly basis for eight consecutive months, with the exception of July and August. The courses in Council Bluffs and Iowa City will be given for eight weeks, while the Clinton course will close at the end of five successive meetings. The fee for the courses at Council Bluffs and Rockwell City will be \$10 and a fee of \$5 will be charged for the Iowa City and Clinton courses. The Marshalltown course will be conducted on an invitation basis by the Marshall, Hardin, Tama and Grundy county societies. Subjects to be covered include endocrinology and metabolism, what the general practitioner should know about the specialties, general therapeutics, some practical applications of new medical knowledge, and a university course dealing with gonorrhea, infection, headache and the malignant conditions.

**Society News**—At a meeting of the Crawford County Medical Society in Denison recently Dr Roland B Morrison, Carroll, showed a film on surgical techniques, and Dr Payson S Adams, Omaha, discussed "Sacral and Caudal Anesthesia."—The Dallas-Guthrie County Medical Society was addressed in Adel, January 20 by Drs Keith W Diddy and George Elridge, both of Perry, on "Infections of the Hands" and "Septic Sore Throat" respectively.—Dr Thomas L Waring discussed "Treatment of Nonunion of Femoral Neck Fractures: An Analysis of Ninety-Three Cases" before the Johnson County Medical Society, Iowa City, January 5 and Dr Robert L Jackson, "Disadvantages of Protamine Insulin in the Treatment of Diabetes Mellitus in Children."—At a meeting of the Monona County Medical Society in Onawa January 11 Dr Walter Scott Sioux City, discussed "Fractured Spine Following Automobile Accidents."—Dr W Eugene Wolcott, Des Moines, addressed the Poweshiek County Medical Society in Grinnell February 1 on "Fractures of the Femur."—A special meeting of the Woodbury County Medical Society was addressed January 21 by Drs Florian E Schmidt, Chicago, and Carl F Jordan, Des Moines, on "Control and Treatment of Pneumonia."—Dr Leon Unger, Chicago, addressed the Scott County Medical Society at Davenport recently on "Eczema in Children." Dr Disraeli W Kopal, Chicago, discussed physical therapy before the society February 1.



## KANSAS

**Instruction in Pneumothorax Therapy**—The Kansas Medical Society's committee on control of tuberculosis announces that instruction in pneumothorax therapy is available to physicians at the state sanatorium for tuberculosis at Norton, in accordance with a plan approved by the board of administration. Physicians wishing this instruction should write to Dr Charles F Taylor, superintendent, to arrange a date for the physician to visit the sanatorium. All instruction and assistance will be given without cost. Dr Taylor has recently developed an inexpensive pneumothorax machine which can be easily constructed by any physician with local mechanical assistance. This machine with the necessary instruction should enable any physician to give pneumothorax treatment, it was stated.

## KENTUCKY

**Society News**—The Jefferson County Medical Society is presenting a refresher course in physiology in lectures at each meeting just preceding the regular program. At the meeting February 7 Hampden C Lawson, Ph.D., associate professor of physiology, University of Louisville School of Medicine, lectured on "Secondary Vascular Shock." Drs Lawrence W. Nehrl and R. Alexander Bate spoke on "Present Status of Collapse Therapy" and "Cancer" respectively.

**Laboratory Service Expanded**—The state department of health announces that district public health laboratories have been established in Ashland, Madisonville and Paducah to facilitate communicable disease control. Specimen containers will be distributed through the branch laboratories to county health departments, which will in turn distribute the containers to individual physicians. In counties in which there is no full time health department, practicing physicians will receive containers directly from the nearest district laboratory. The new laboratories will perform only procedures that have a public health significance.

## LOUISIANA

**New Professor of Clinical Orthopedics**—Dr Guy A. Caldwell, since 1923 in charge of orthopedics and fractures at Charity Hospital Shreveport has been appointed professor of clinical orthopedics at Tulane University of Louisiana School of Medicine, New Orleans.

## MARYLAND

**Public Lectures**—Dr A. Stampar, former director of health of Yugoslavia, delivered a lecture on "International Health Work" in the De Lamar series in hygiene at Johns Hopkins University School of Hygiene and Public Health, March 3. Dr Thomas Parran, surgeon general, U. S. Public Health Service, gave a Delta Omega lecture on "A Forward Look at National Health" at the school March 1.

**Physicians and Patients in Mental Hospitals**—Thirty physicians were caring for the 7,212 insane or feeble-minded patients in state institutions at the end of the last fiscal year, according to a report of the board of mental hygiene. None of the four hospitals for the insane, as distinguished from two institutions for the feeble-minded, has as many as one physician to each 150 patients. Only the Eastern Shore institution at Cambridge came within the nursing standard showing a ratio of seven patients to each attendant. Admissions for the fiscal year reached 3,722, the highest total since 1933. Nearly 65 per cent of all patients remain in the hospitals less than a year and about 18 per cent leave within one month. 49 per cent of patients who die in the institution die within a year.

## MICHIGAN

**Outbreak of Typhoid**—Newspapers reported an outbreak of typhoid in Muskegon County February 10 involving twenty-seven persons in thirteen families and causing three deaths. Four cases were reported in Marquette February 11. It was believed that the Marquette outbreak was caused by a carrier, but the results of the Muskegon investigation had not been announced at the time of this report.

**Dr Stevens Honored**—Dr Rollin H. Stevens, Detroit, was guest of honor at a dinner January 28 given by the staff of Grace Hospital, the Detroit Roentgen Ray and Radium Society and the Detroit Dermatological Society in observance of his seventieth birthday. Among other gifts Dr Stevens received a leather bound copy of the January issue of *Radiology*, which was dedicated to him. Each guest received a reprint of the opening article in the journal entitled "Rollin Howard Stevens: An Anniversary Chronicle of His Useful Life" by Dr Percy Brown, Boston.

**State Society Nights**—The Hillsdale County Medical Society joined with the Jackson County Medical Society this year in sponsoring its third annual "state society night" in Jackson January 18. The latter society is, according to the state medical journal, the originator of these affairs. The speakers included Dr Henry Cook, Flint, president of the state medical society. The Kent County Medical Society held a similar program in Grand Rapids February 9 and the Lenawee County Medical Society in Adrian, February 16. A meeting in Sturgis in April is planned by the St. Joseph and Branch county medical societies.

**Society News**—Dr Walter A. Bastedo, New York, discussed "Physician and Pharmacist" at a joint meeting of the Detroit Retail Druggists Association and the Wayne County Medical Society March 7. Dr George W. Kosmak, New York, addressed a joint meeting of the Detroit Obstetrical and Gynecological Society and the Wayne County Medical Society, February 28, on "The Responsibility of the Medical Profession in the Movement for Birth Control."—At a meeting of the Oakland County Medical Society in Bloomfield Center March 3 Dr William Mithoefer, Cincinnati, discussed "Reasons Why Nasal Sinus Surgery Is in Disrepute."—Dr Lawrence Reynolds, Detroit, discussed "Roentgenologic Aspects of Dyspepsias" before the Ingham County Medical Society, Lansing, February 15.

## MINNESOTA

**Hospital News**—Construction has been started on the new \$542,000 Wyman addition to the Abbott Hospital, Minneapolis, according to *Modern Hospital*. The new unit will be four stories high.—Dr George R. Minot, Boston, delivered a lecture January 20 at the Mayo Clinic, Rochester, on "Some Aspects of the Etiology, Diagnosis and Treatment of Anemia." Dr Jose Valls, professor of orthopedic surgery, National University of Buenos Aires, gave a Mayo foundation lecture February 3 on "Treatment of Fractures of the Neck of the Femur."

## NEW YORK

**Short Course on Heart Disease**—Dr Wilhelm Dressler, Vienna, Austria, gave an address January 19 at the Syracuse University College of Medicine, on "Complications and Sequelae of Coronary Thrombosis." Dr Dressler gave a series of lectures at the college for five days beginning January 20, on treatment for heart disease.

**Society News**—Dr Herbert H. Bauchus, Buffalo, addressed the Medical Society of the County of Niagara, Lockport, January 11, on "Common Skin Lesions, Their Diagnosis and Treatment."—Dr Alfred Wachsberger, New York, addressed the Richmond County Medical Society at a meeting in Grasmere, January 12, on treatment and management of sinusitis.—Dr Frank H. Lahey, Boston, addressed the Chemung County Medical Society, Elmira, January 5, on "Newer Clinical and Laboratory Developments in Thyroid Disease."—Dr Cornelius P. Rhoads, New York, addressed the Medical Society of the County of Albany, February 23, on "Refractory Anemia, Nature and Treatment."—Dr Edmund B. Spaeth, Philadelphia, addressed a joint meeting of the Syracuse Eye, Ear, Nose and Throat Club with the Syracuse Academy of Medicine, March 15, on "Ptosis and Its Correction."—Dr Elliott P. Joslin, Boston, addressed the Utica Academy of Medicine, February 17, on "The Present Status of Diabetes in the United States."

## New York City

**Academy Presents Lectures for Teachers**—The New York Academy of Medicine and the Board of Education are presenting jointly a series of lectures for teachers in the public schools under the general title "The Health of the Pupil."

**Gifts to Columbia**—Gifts received by Columbia University during January included the following for medical purposes:

Mrs. Winter Meade \$11,000 for construction at the Medical Center.  
John and Mary R. Markle Foundation \$9,000 for research in the departments of practice of medicine and neurology.  
Mrs. Brooks Emery \$2,000 for research in diseases of children.  
E. R. Squibb and Sons \$1,250 for research in biologic chemistry.  
Ciba Pharmaceutical Products Inc. \$1,250 for research in biologic chemistry.  
F. Trubee Davison \$1,200 for the F. Trubee Davison Jr. Gift Fund for the study of leukemia, lymphosarcoma and allied diseases.

**Division of Tuberculosis Established**—Dr Allen Kane, medical superintendent of the Municipal Sanatorium at Otisville, has been appointed director of a division of tuberculosis newly established in the New York City Department of Hospitals. Dr Kane will supervise care of the tuberculous in city hospitals, promote coordination of the tuberculosis service of

the department of hospitals with that of private hospitals and perform various other duties directed toward improvement of the service. Dr Kane graduated from Northwestern University Medical School, Chicago, in 1924.

### NORTH CAROLINA

**Course on Typing Pneumococci**—A course of instruction for laboratory technicians in typing of pneumococci was given at Duke University School of Medicine, Durham, during the week of January 24. Sixty-nine technicians registered. The course was presented as part of a program of pneumonia control recently undertaken by the state board of health, the Medical Society of North Carolina and other agencies. A symposium on pneumonia was presented January 28 by Drs Wiley D Forbus, Douglas H Sprunt, David T Smith, Robert J Reeves, Frederick M Hanes, Julian Deryl Hart and Angus M McBryde.

### NORTH DAKOTA

**Changes Recommended in Public Health Services**—The Rockefeller Foundation recently completed a survey of the public health program in North Dakota which recommended various improvements. Among them were greater emphasis on enactment of standard milk ordinances in cities, responsibility of the state health department for tourist camp sanitation with provisions in the laboratory for chemical analysis of water and sewage, more conscientious enforcement of quarantine regulations, compulsory smallpox vaccination, with federal aid for free vaccine and vaccination of infants before their first birthdays, public funds for payment of physicians for treatment of patients with venereal disease, enactment of laws to require premarital examination for venereal disease.

### OHIO

**The First Selman Lecture**—The first lecture under the Julius J Selman Foundation, established in memory of Dr Selman by his friends, will be given at Mount Sinai Hospital March 14 by Dr Albert A Epstein, New York, on "Nephrosis."

**State Board Prosecutions**—At a meeting of the State Medical Board of Ohio in Columbus January 4 the following results of prosecutions instituted by the board within recent months, among others, were reported:

Clifton Engel Sandusky, unlicensed chiropractor, found guilty of conducting in office fined \$500 and costs \$250 was remitted on condition that objectionable practice and advertising be discontinued and that a fine of \$50 for a previous offense be paid.

Maie Jerome Ashtabula, found guilty of illegal practice fined \$500 and costs \$450 suspended on condition that she leave the state.

Richard C Geilus Ashtabula found guilty of illegal practice fined \$500 and costs \$450 suspended on condition that he leave the state.

William C De Benis Cincinnati, unlicensed chiropractor, fined \$50 and costs.

Alfonso Babla Columbus, illegal practice, fined \$500 and costs, suspended on condition that he leave the state.

J C Carmell Clarence C Cox Robert E Cox Hugh T Pennell James R Couch and Bruce A Tanner Columbus, unlicensed naprapaths, fined \$200 each for illegal advertising. An appeal was filed.

**Society News**—Dr Charles F Geschickter, Baltimore, addressed the Academy of Medicine of Cleveland, February 18, on "Diseases of the Breast."—Members of the medical section of the Industrial Commission of Ohio presented a symposium before the Toledo Academy of Medicine February 4. The speakers, all of Columbus, were Drs Roy J Secret, on "Encephalography as an Aid to Diagnosis in Obscure Head Injuries", Maurice B Rusoff, "Evaluation of Disability", Henry P Worstell, "Chronic Osteo-Arthritis", Sidney M McCurdy, "Relationship of Workmen's Compensation to State Medicine," and Mr J A Davis, attorney, "The Expert Medical Witness."—A symposium on fractures made up the program of the Mahoning County Medical Society February 16 at a joint meeting with the Sixth Council District Medical Society in Youngstown. The speakers were Drs Ralph R Morrall, Chester S Lowendorf, Thomas K Golden, William D McElroy and John R Buchanan, all of Youngstown.—Dr John H J Upham, Columbus, President of the American Medical Association, addressed a joint meeting of the Academy of Medicine of Cincinnati and the Cincinnati Dental Society, February 1, on "Present Day Economic Problems of Medicine and Dentistry." Dr Chester M Jones, Boston, addressed the academy, February 15 on "Edema and Ascites in Hepatic Insufficiency."

### OKLAHOMA

**Personal**—Dr Thomas I McGrath, Savre, has been appointed health superintendent of Beckham County to succeed Dr Henry K Speed Jr, who resigned to become superintendent of the new Western Oklahoma Charity Hospital at Clinton.—Dr Russell H Lynch, Holts, has been appointed health officer of Harmon County.

### OREGON

**New Health Unit**—Establishment of a health unit for Multnomah County was recently announced. Dr William R Hicks, formerly of Yonkers, N Y, a graduate of Syracuse University College of Medicine in 1936, will be the health officer.

**Medical Library to Be Expanded**—The University of Oregon Medical School, Portland, recently announced a grant of \$100,000 from the Rockefeller Foundation for expansion of the school's library facilities. A new wing will be added to the medical school building at a cost of about \$200,000, part of which will be obtained from other gifts. The new appropriation brings to \$800,000 the contributions of the Rockefeller Foundation to the Portland medical center.

**Jones Lectures**—Dr Eugene M Landis, assistant professor of medicine, University of Pennsylvania School of Medicine, Philadelphia, delivered the annual N W Jones Lecture at the University of Oregon Medical School, Portland February 9-10. Dr Landis's topics were "Capillary Pressure, Capillary Permeability and the Movement of Fluid Through the Capillary Wall" and "The Effects of Pressor Drugs and Kidney Extracts on Blood Pressure and Peripheral Blood Flow."

### PENNSYLVANIA

**Society News**—Drs Paul Titus and Ralph E Tafel, Pittsburgh, presented a motion picture on "Human Sterility" at a meeting of the Fayette County Medical Society, Uniontown, March 3.—Dr Edward L Bortz, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, March 1, on pneumonia.

### Pittsburgh

**Society News**—At a meeting of the Pittsburgh Academy of Medicine, February 22, the speakers were Drs Chester F Beall, on "Acute Yellow Atrophy of the Liver in the Puerperium", Robert R Clark, "Acute Lung Abscess," and Theodore Diller, "Some Problems and Dilemmas."—Dr Robert W Staley, among others, addressed the Pittsburgh Neuropsychiatric Society, February 21, on "Insulin Hypoglycemia in Schizophrenia Therapy."

**Diabetes Clinic Dedicated**—Dr Elliott P Joslin, Boston, was the speaker at the dedication February 8 of an addition to the Children's Hospital to be known as the Renziehausen Memorial Ward and Clinic. The new ward was built with funds provided by Miss Emily Renziehausen, who in August 1937 made available to the hospital a trust fund of a million dollars for research in the causes, treatment and cure of diabetes (THE JOURNAL, Sept 18, 1937, p 963). Dr George Booth is in charge. At the dedication ceremony, held in the auditorium of Mellon Institute, Dr Joslin announced that he would present to Miss Renziehausen a medal known as the Joslin award in recognition of her twenty years of nursing a brother with diabetes. The Joslin award has previously been given only to Sir Frederick G Banting, Toronto, one of the discoverers of insulin, and Francis G Benedict, Ph D, Boston, who has spent many years in research on diabetes.

### UTAH

**Annual Registration Due April 1**—All practitioners of medicine and surgery licensed to practice in Utah are required to register annually on or before April 1, with the department of registration, and to pay a fee of \$3. If a licensee fails to reregister within from ninety days to six months after April 1, his license can be revoked and, if revoked it will be reinstated thereafter only on his paying the delinquent registration fees and an additional year's fee as a penalty.

### VIRGINIA

**Society News**—Dr William J Cusack, Washington D C, addressed the Arlington County Medical Society at the Washington Golf and Country Club January 20 on "The Relation of the Endocrines to Menstrual Irregularities."—Dr Robert DuVal Jones Jr, Norfolk, presented a paper on "Diagnosis of Carcinoma of the Colon" at a meeting of the Northampton County Medical Society, January 6.—Dr Arthur M Shipley, Baltimore, addressed the Norfolk County Medical Society, Norfolk, January 10 on "The Diaphragm as a Surgical Problem."—Drs Claude C Coleman and Carrington William Richmond addressed the Richmond Academy of Medicine, January 25 on "Neurologic Aspects of Low Back Pain and

"The Etiology of Malignant Tumors" respectively—Speakers at a meeting of the Roanoke Academy of Medicine January 3 were Drs. John E. Gardner, on "Electrocardiographic Diagnosis of Cardiac Infarction", William L. Powell, "Fissure in Ano," and William W. S. Butler Jr. "The Prognosis in Syphilis"

### WYOMING

**Annual Registration Due April 1**—All practitioners of medicine and surgery licensed to practice in Wyoming are required by law to register on or before April 1, with the secretary of the board of medical examiners, and to pay a fee of \$2.50. If a licensee fails to pay the fee within three months after April 1, his license can be annulled, and if annulled it will be reinstated only on his paying the stated fee, plus \$5 as a penalty.

### GENERAL

**Max Brodel Honored at Saunders Anniversary Dinner**—Mr. Max Brodel, associate professor of art as applied to medicine, Johns Hopkins University School of Medicine, Baltimore, was guest of honor at a dinner in The Barclay, Philadelphia, March 4, given by the W. B. Saunders Company, medical publishers. The occasion marked the firm's fiftieth anniversary. About 200 persons were present. Mr. Lawrence Saunders, president of the company, presented to Johns Hopkins a portrait of Mr. Brodel, a photograph of which is reproduced here. Edward W. Berrv, provost of the university, accepted it. Mr. Ryland W. Green, vice president of the Saunders Company, gave the address of welcome. Dr. Thomas S. Cullen, Trustee of the American Medical Association and professor of gynecology at Johns Hopkins, acting as toastmaster, reviewed "The Creation of the Department of Art as Applied to Medicine in the Johns Hopkins Medical School." Dr. Howard A. Kelly, professor emeritus of gynecology, who brought Mr. Brodel to this country in 1894 to illustrate his work, spoke of his contributions to gynecology. Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, spoke of "Max Brodel's Influence on Medical Illustrating" and Mr. Henry L. Mencken, Baltimore, author and editor, "Mr. Brodel as a Pianist." Mr. Brodel was born in Leipzig, Germany, June 8, 1870. He received his early education at the Technical High School and the Leipzig Academy of Fine Arts. During vacations he worked in the Anatomical Institute for His Braune and Spalteholz and in the Physiological Institute for Carl Ludwig and his pupils. In 1890 he was drafted into the army, but was required to serve only one year under arms, his second year of military service being devoted to artistic work for his regiment. In 1892 he returned to Leipzig as a free lance artist specializing in anatomic and physiologic illustrations. In 1910 a wish of Mr. Brodel was realized when under an endowment the first School of Art as Applied to Medicine was established at Johns Hopkins and he was placed in charge. Under his direction the school has expanded until it is the largest and most important of its kind in the country. For four years before the school was created, Mr. Brodel was instructor at Johns Hopkins. The portrait of Mr. Brodel is the work of Thomas Corner, Baltimore. Mr. Brodel is an honorary member of the Medical and Chirurgical Faculty of Maryland.

**Pediatric Board Examinations**—The American Board of Pediatrics announces that it will hold an examination in New York May 3-4 and in San Francisco June 12. Dr. Charles A. Aldrich, 725 Elm Street, Waukegan, is secretary of the board.

**Central Neuropsychiatric Hospital Meeting**—The annual meeting of the Central Neuropsychiatric Hospital Association will be held in Chicago at the Medinah Club, March 18. Speakers will be Drs. Lloyd H. Ziegler, Wauwatosa, Wis., on "Management and Education of Relatives of Hospitalized Patients", William C. Menninger, Topeka, Kan., "Modern Treatment of Alcoholism," and Douglas A. Johnston, Cincinnati, "Insulin and Other Shock Treatments in Schizophrenia."

**Southeastern Gynecologists and Obstetricians Organization**—The Southeastern Obstetrical and Gynecological Society was organized at a meeting in Charlotte, N. C., February 4, with delegates from North and South Carolina, Virginia, Georgia and Florida. Dr. James R. McCord, Atlanta, was elected president, Dr. Robert E. Seibels, Columbia, S. C., vice president and Dr. Robert A. Ross, Durham, N. C., secretary. Dr. Marvin Pierce Rucker, Richmond, presided at the organization sessions.

**Tri-State Medical Association**—Dr. Jacob F. Highsmith, Fayetteville, N. C., was named president-elect of the Tri-State Medical Association of the Carolinas and Virginia at its meeting in Asheville February 21-22.

Vice presidents were elected as follows: Drs. Wright Clarkson, Petersburg, Va., William L. Pressly, Due West, S. C., and Charles A. Hensley, Asheville, N. C. Dr. James M. Northington, Charlotte, N. C., was reelected secretary. Guest speakers at the meeting included Drs. Henry T. Chickering, New York, on "The Practical Value of Typing in Pneumonia" and Henry J. John, Cleveland, "The Outlook for Diabetic Children." The next meeting will be in Charleston, S. C.

**Traffic Safety Awards**—Alfred P. Sloan, chairman of the board of General Motors Corporation, recently gave \$25,000 to the Automotive Safety Foundation, which will use the money for additional and personal awards in the national traffic safety contest conducted by the National Safety Council. Twelve police officers and eight traffic engineers will be selected from the prize winning cities and states in the contest to spend a year in study of traffic safety, the former at Northwestern University, Chicago, and the latter at Harvard University, Cambridge, Mass. Each will receive \$1,000 in cash, plus a full year's tuition. Results of the contest will be announced early in April.

**Changes Recommended in List of Causes of Death**—The committee on the accuracy of certified causes of death, American Public Health Association, announced in *Public Health Reports*, February 4, recommendations for changes in the International List of Causes of Death, which the committee will present at a conference in Paris next October. Among other changes, the committee recommends breaking up Class I in the International List into eight subclasses, as follows: diseases due to bacteria, spirochetes, filtrable viruses, rickettsia, protozoa, helminths, fungi, other infectious and parasitic diseases. It also recommends establishment of subtitles in the group relating to cardiac diseases, to provide for a statistical record of cardiac lesions of rheumatic disease, rearrangement of titles relating to nephritis to bring this group into closer agreement with modern conceptions of the disease, rearrangement of the titles relating to puerperal conditions, designed to meet the needs of the finer analysis of puerperal mortality.

**Mortality in Twenty-Seven Cities**—The New York City Department of Health recently published its annual summary of vital statistics of twenty-seven large cities with a total population of more than 27,000,000. The report covers 1936. The crude general death rate for the twenty-seven cities was 11.8, as against 11.4 in 1935. The lowest death rate among them was 8.9 for Milwaukee followed by 9 for Detroit. The



MR. MAX BRÖDEL

highest was that of New Orleans, 173, with Denver next, 157. The report points out that these crude death rates take no account of the age composition of the population, that certain cities have a large proportion of Negroes in their population and that many deaths charged to a city are among nonresidents, a factor influenced by availability of hospital facilities. For the 403,038 births reported by the twenty-seven cities there were 20,055 infant deaths, a rate of 49.8 per thousand live births. The birth rate for the group of cities was 14.8 in 1936 as against 15 in 1935. Chicago and Portland, Ore., had the lowest infant mortality rate among the cities, 39. New Orleans had the highest rate, with 93, Washington, D. C., was next with 72.

**Society News**—Dr George E. Bennett, Baltimore, was chosen president-elect of the American Academy of Orthopedic Surgeons at its annual meeting in Los Angeles in January. Dr John C. Wilson, Los Angeles, was installed as president. Dr Clarence B. Francisco, Kansas City, Mo., was elected vice president, and Dr Carl E. Badgley, Ann Arbor, secretary. Dr Philip Lewin, Chicago, received the principal award, a gold medal, for the best exhibit, his subject was teaching orthopedics to undergraduate students. The 1939 convention will be held in Memphis, Tenn.—Dr Harold L. D. Kirkham, Houston, Texas, was elected president of the American Association of Oral and Plastic Surgeons at its annual meeting in Houston and Dallas, January 31 and February 1. Dr Gordon B. New, Rochester, Minn., was elected vice president and Dr Ernest Fulton Risdon, Toronto, secretary. Dr James T. Mills was host to the meeting at Baylor Hospital in Dallas and Dr Kirkham at Jefferson Davis Hospital in Houston. Membership in the association is limited to fifty.—Dr Roy B. Harrison, New Orleans, was chosen president-elect of the Federation of State Medical Boards of the United States at the annual meeting in Chicago February 15. Dr Henry J. Lehnhoff, Lincoln, Neb., is president and Dr Julian F. Du Bois, Sauk Centre, Minn., vice president. Dr Walter L. Bierring, Des Moines, Iowa, was reelected secretary.

#### CANADA

**Personal**—Dr Edward W. Archibald, formerly head of the department of surgery, McGill University Faculty of Medicine, Montreal, received the honorary degree of doctor of medicine from the University of Paris at a ceremony at McGill January 11. Count Robert de Dampierre, minister of France to Canada, made the presentation.

#### LATIN AMERICA

**New Health Officials in Mexico**—Dr Leonidas Almazan, former minister from Mexico to Germany, has been appointed director of public health of Mexico, it is reported. He succeeds Dr Jose Surob, who is now director of health for the federal district, including the city of Mexico. It is also reported that Dr Enrique Hernandez Alvarez has been made secretary of public welfare.

**Tuberculosis Campaign in Cuba**—The Cuban government has recently allotted \$1,000,000 from its lottery funds for a campaign against tuberculosis. The *Health Officer* reports Clinics are to be established throughout the country for examinations, which will be carried out on every citizen. Dr Edgar Mayer and Morton C. Kahn, Ph.D., New York, recently visited the island to help establish the first clinics. With Dr Wilson G. Smullie, New York, they will return periodically to advise in the work, it is said. L'Esperanza Hospital near Havana has been renovated for the care of tuberculous patients and a new hospital is being built near Trinidad.

#### FOREIGN

**Society News**—The seventh International Congress of Genetics will meet in Edinburgh in 1939, probably August 23-30, according to *Science*. Prof. Francis A. E. Crew of the Institute of Animal Genetics, University of Edinburgh, has been appointed general secretary.—The German Society for Circulatory Research will hold a meeting March 26-27 in Bad Nauheim. The subject of discussion will be "Circulatory Collapse."

**International Congress for History of Medicine**—Applications to attend the ninth International Congress for the History of Medicine in Yugoslavia September 3-11 should be made to Dr Vladimir Bazala, secretary general of the congress, 95 Vlaske ulice, Zagreb, Yugoslavia. The congress will open in Zagreb and other meetings will be held in Belgrade, Sarajevo and Dubrovnik. Applications to address the congress should be made as soon as possible by cablegram naming the subject to be treated according to an announcement.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb. 12, 1938

#### Radiotherapy in Nonmalignant Gynecologic Conditions

At a joint meeting of the Sections of Radiology and of Obstetrics and Gynecology of the Royal Society of Medicine a discussion took place on radiotherapy in nonmalignant gynecologic disorders. It was opened by Dr W. M. Levitt, radiologist, who said that the time had come to formulate indications for radiotherapy in fibromyoma. X-rays had given good results for over thirty years, the bleeding stopped and the fibroid diminished and sometimes even disappeared. The mode of action was mainly through the ovaries. Consistently good results postulated sterilization, which was equally effective with out direct irradiation of the fibroid. In patients under 40, radiotherapy was excluded unless the condition was so extensive as to make successful pregnancy impossible. The contraindications applied only to a small minority of cases—very large fibroids causing pressure symptoms, acute complications and degeneration in the fibroid. High voltage x-rays were now always used and were given in six daily applications.

Another indication for radiotherapy was endometriosis. The radiologist had to consider whether he would destroy the tumor by direct irradiation or whether sterilization also was necessary. Interstitial radium might give better results than x-rays, and sterilization might be avoided in certain cases, especially when the disease was situated in the rectovaginal septum. Radiotherapy was also the method of choice for irregular function and hemorrhage at or near the menopause, but in younger patients it had the same limitations as for fibroids. Only in grave cases, such as severe hemorrhage at puberty, should this rule be relaxed.

Dr J. F. Bromley, radiologist, discussed extra-uterine conditions. Radiotherapy gave good results in many cases of acromegaly, especially in relieving the unbearable headache. Hypertrophy of the parathyroid causing bony atrophy could sometimes be relieved. Menorrhagia was often caused by hypersecretion of estrogen, and direct irradiation would sometimes arrest the function of the ovaries.

Mr L. Phillips, gynecologist, said that in menopausal menorrhagia castration doses of radiotherapy gave better results in every way than surgery. There was less hospitalization, and the mortality and morbidity were lower. Radium produced disturbances of metabolism, peritonitis and uremia, but the death rate was under 1 per cent, a low figure compared to hysterectomy. A castration dose of x-rays would induce the menopause over a longer period and more gradually than radium. It was suitable for large tumors and not contraindicated by pelvic inflammation.

Prof. Miles Phillips, president of the Section of Obstetrics and Gynecology, referred to the stimulating effect of x-rays. A woman of 29, who had not menstruated for ten years, began to do so after roentgen therapy and gave birth to two boys. He suggested that the dose might have destroyed a corpus luteum which was preventing ovulation. The bulk of evidence suggested that radium acted on the ovary. If it was inserted in the second half of the cycle the patient would probably have another period, if inserted in the first half she probably would not.

#### Torsion of the Hydatid of Morgagni

Torsion of the testicle or axial rotation of the spermatic cord has long been recognized but torsion of the little appendix termed the hydatid of Morgagni has been known only since 1922. Though it seems to be commoner than has been supposed, it has seldom been recognized and is generally mistaken for spontaneous epididymo-orchitis at or about puberty. Though

the first cases were recorded by English writers (Colt, Shattock and Walton), it is largely to French writers especially Mouchet, that credit is due for establishing the clinical syndrome. In the *British Journal of Surgery* Dr John Lambert of Wellington College and Dr R E Smith of Rugby have reported nine cases of torsion of the testicle and of the hydatid of Morgagni. As three of these cases belong to the latter category, their proportion bears out the view that the condition is not so uncommon as might be supposed. The general signs differed little from those seen in torsion of the spermatic cord, therefore the diagnosis must depend on accurate interpretation of local signs. The first patient, a youth of 17, had a sudden attack of pain in the left testicle at about 5 a.m. There was some swelling and marked tenderness of the upper part of the epididymis. The spermatic cord was not swollen or tender. In the evening the temperature rose to 100 F. Next day the testicle and epididymis were greatly swollen. He had a slight evening elevation of temperature and a surgeon suggested acute tuberculosis of the testicle. There was a gland scar in the neck. He was sent home and sixteen days after the onset came under the care of Sir John Fraser of Edinburgh, who operated and found torsion of the cord and the testicle in a condition of complete necrosis. Examination of the specimen showed that the torsion began in the hydatid of Morgagni which had an unusually long pedicle.

## PARIS

(From Our Regular Correspondent)

Feb 12, 1938

### Periodic Medical Examination of Automobile Drivers

At the January 25 meeting of the Académie de médecine a paper was read by Professor Parisot and Dr G Richard of Nancy on medical examination of automobile drivers. In 1937 there were 1,700,000 passenger automobiles and 155,000 trucks here as compared with 100,000 twenty years ago. During the last few years there have been between 3,000 and 4,000 deaths and from 50,000 to 70,000 injured annually in France, despite numerous precautions taken to prevent automobile accidents. At the sixteenth medicolegal congress, held in 1931, it was shown that more deaths were due to automobile injuries than to typhoid and diphtheria combined. The human factor is responsible for accidents in from 36 to 80 per cent, according to various statistics cited. Medical examination of chauffeurs has been advocated by the Académie de médecine since 1930. Such tests are already obligatory for drivers of passenger cars and trucks in seventeen European countries. In four others (France, Austria, Belgium and Switzerland) such an examination is required only of truck drivers. Gratifying results have been noted in Paris since 1928 when medical examination was first required of all candidates for positions as chauffeurs and mechanics of motor busses and subway trains in Paris. In 1923 there was one accident for each 105,000 passengers and in 1936 only one to 212,300 passengers.

The authorities here have always opposed extension of obligatory medical examination to all chauffeurs citing England as an example of a country in which there are comparatively few accidents although medical examination is not compulsory. The authors showed the fallacy of this argument by citing statistics of automobile accidents in both England and the United States. There were 204,710 accidents in England in 1933 and as the result of more strict control of the granting of driving licenses this number dropped to 195,892 in 1935. There were 7,343 deaths in 1934 as compared to 6,502 in 1935 and the number of injured dropped from 231,603 in 1934 to 221,726 in 1935. A system of periodic examinations for all motor drivers who were above a certain age or showed physical defects was instituted in England in 1936. Every chauffeur above the age of 50 is obliged to submit to a medical examination every six years up to the age of 65 every five years between the ages of 65 and 73 and every year thereafter.

A number of examples were mentioned by the authors of fatal accidents due to cardiovascular disturbances in chauffeurs. The authors advocated the passage of a law in France making periodic medical examinations obligatory. This should be carried out according to the following schedule: every six years for all chauffeurs from 18 to 45 years of age, every five years between the ages of 45 and 55, every three years between the ages of 55 and 60, every two years between the ages of 60 and 65 and every year above the age of 65.

Following the reading of this paper, a committee of six fellows of the Académie de médecine was appointed to draw up a law covering these recommendations.

### BCG Tuberculosis Vaccine in Children

At the February 1 meeting of the Académie de médecine a paper by Dr A de Carvalho of Rio de Janeiro Brazil was read by Dr Guérin of the Pasteur Institute of Paris. Thirty-eight families in which tuberculosis existed were observed by Dr Carvalho over a period of eight years. Of 101 children constantly exposed to infection from tuberculous parents, forty-eight were given the BCG vaccine by mouth from the time of birth and the remaining fifty-three were not vaccinated. In twenty-five of the families there were only two children, one of whom was vaccinated and the other not. Neither the vaccinated nor the nonvaccinated children were isolated. The result was a tuberculosis morbidity of 20.8 per cent among the vaccinated and of 39.6 per cent among the nonvaccinated children and a mortality from tuberculosis among the vaccinated children of 2.1 per cent as compared to one of 13.2 per cent among the nonvaccinated. Two thirds of the deaths in the unvaccinated group occurred during the first twelve months after birth.

### Tuberculin Epidermal Reactions in Pupil Nurses

At the January 11 meeting of the Académie de médecine a paper was read by Professor Rist and his associates in which the results of a study of tuberculin epidermal reactions in 165 pupil nurses of one of the large training schools were reported. All of the pupil nurses had x-ray examination of the lungs, the family and previous histories did not reveal the presence of tuberculosis. During 1935, 165 probationers were admitted to the schools, of whom 144 were given ward service as a part of their course and the remainder were to be trained for administrative work. The latter group was not exposed to tuberculous infection in the wards, as were those in the first group. The epidermal tuberculin tests on admission to the training school were positive in about the same proportion in the two groups: 58.33 and 61.90 per cent. Tuberculin epidermal tests were made in June 1936 and January 1937 and were repeated in October 1937. At the last named date, two years after admission to the training school, forty-six of sixty-eight pupil nurses who had entered with a negative epidermal tuberculin test had a positive reaction. In other words a primary infection had taken place during the first two years of their training period. The percentage of positive reactions was much higher, 88.73, in the first group who had been exposed to infection in the wards, than in the second group who had not been so exposed. The test remained negative in sixteen of the sixty pupil nurses whose reaction had been negative on admission to the school. In six of the forty-four pupil nurses whose negative test on admission had changed to a positive one during the two years school term both clinical and roentgenologic signs of a more or less severe pulmonary tuberculosis appeared. One of these six pupil nurses died from such an infection. Professor Rist and his associates were of the opinion that their results confirmed the observations of Heimbeck at the nurses training school in Lilleval who found that both the relatively high morbidity and mortality from tuberculosis had been greatly reduced as the result of the use of the BCG vaccine on admission to the school. The authors believed that it might be advisable to study the question of employing such vaccination in pupil nurses in France.

### Auto-Agglutination of Red Blood Cells

An unusual case of agglutination of a patient's red blood cells by his own serum was reported at the Dec 17, 1937, meeting of the Societe medicale des hopitaux of Paris by Dr P Michon and his associates. This condition is rare, all the reported cases up to 1930 having been cited in an article by one of the authors. Since that time, four other cases have been reported. In the case reported by Michon and his associates, a young chemist had been treated for asthenia in 1932. There had been, at that time, a marked alkalosis (758) and a mononucleosis of 42 per cent. Following inhalation of large amounts of gasoline vapor in April 1937, symptoms of pulmonary congestion appeared. The first enumeration of the red blood cells was attempted about four weeks later but was found to be impossible because of an auto agglutination. A drop of blood left at room temperature, after having been diluted with two drops of physiologic solution of sodium chloride to slow up the agglutination, showed a fusiform elongation of the red blood cells and the production of lines of force. The last two changes are termed the Sandow phenomenon, as described by Zimmer in 1936, and are considered typical of iso-agglutination. The patient's serum agglutinated human red blood cells of all four groups. Although the bleeding time was only three minutes, the coagulation time was twenty-one minutes. The clinical symptoms during the following three months indicated a vasomotor dysfunction. By July 21 the auto-agglutination had entirely disappeared, both the red blood cells and serum showing reactions typical of group 2, the coagulation time was still prolonged, twelve minutes, but no evidence of hemophilia appeared at any time. The authors were of the opinion that the cause of the temporary phenomenon of auto-agglutination was the inhalation of large quantities of gasoline vapor.

### Death of Professor Doleris

Professor Doleris, one of the most prominent French gynecologists and obstetricians of the nineteenth century, died Jan 22, 1938, aged 86. His graduating thesis, published in 1882, on the bacteria found in puerperal fever, represented work done under the supervision of Pasteur. Aside from the streptococcus and staphylococcus as causative organisms he called attention to the important part played by certain other organisms, especially the gangrene producing bacteria. Doleris was gynecologist and obstetrician at one of the large Paris hospitals for many years. He was one of the first to advocate round ligament suspension of the retroverted uterus.

### BERLIN

(From Our Regular Correspondent)

Jan 17, 1938

### Medicolegal Decisions Relative to the Value of Nature Medicine

The recent report on Nature Medicine and the heilpraktiker must needs be supplemented by further medicolegal news items. Of special interest were the criminal proceedings brought against not a heilpraktiker (lay practitioner) but a licensed physician who was charged with criminal negligence. He had refrained from the administration of diphtheria antitoxin in a correctly diagnosed case. The defendant a practitioner of Nature Medicine was still treating the patient, a girl aged 17 with swabbings and poultices as late as the fourth day of illness and after the diagnosis of diphtheria had been established. Only on the sixth day did he authorize transfer of the patient to a hospital where she died. The public prosecutor asked a ten months jail sentence but the doctor was acquitted. The phrasing of the court's decision in this case offers an interesting sidelight on current medicolegal ideology. Much weight was given the contention that the defendant had tried several procedures considered rational according to the standards of Nature Medicine but that owing to the rapid advance of the

infection, these had been ineffectual. Against the defendant was his failure to acquaint the girl's parents with the importance of inoculation, a measure generally regarded as infinitely more effective than any procedure of Nature Medicine. But there is no law under which a practitioner can be held responsible for the fatal termination of a case simply on the basis of his abstention from utilizing a procedure, even one which in all probability would preserve the patient's life. In the case under discussion the two expert medical witnesses, a professor of internal medicine and a professor of pediatrics, stated that the experimental limits for the favorable effect of diphtheria antitoxin lay between 70 and 75 per cent, a figure which in any event would refute the allegation of criminal negligence.

Another case of alleged criminal neglect in the treatment of diphtheria was reviewed by the supreme court of Germany. The defendant, a physician of Frankfurt on the Main, was charged with criminal responsibility in the deaths of three diphtheria patients whom he had treated according to homeopathic methods. Regular medical measures such as administration of antitoxin had been omitted. The court of first instance acquitted this man. The public prosecutor then asked the supreme court to set aside the judgment of the lower court. The highest tribunal, in denying the prosecutor's appeal, expressed the following opinion. The relative superiority of "allopathic" methods as opposed to homeopathic methods or vice versa has thus far not been sufficiently proved either in theory or in practice, accordingly a rejection of the principle of serotherapy by the defendant cannot be construed as a criminal offense. Moreover, evidence had been adduced to show that the practitioner had successfully treated a majority of his diphtheria patients by homeopathic methods. Therefore, held the court, he was under no obligation to administer antitoxin in the cases under discussion.

The foregoing examples illustrate the trend of juridical opinion in present-day Germany with regard to the serotherapy of diphtheria.

On the other hand, several heilpraktiker have recently been convicted of criminal negligence in connection with the deaths of patients (THE JOURNAL January 8, p 141). One case concerned the death of a child from acute appendicitis and peritonitis. The defendant, who had passed the official examination required of heilpraktiker and was a prominent member of the heilpraktiker's league, had diagnosed the illness as 'gastro enteric catarrh' and prescribed various homeopathic medications for its relief. A regular physician was called in but too late. According to the expert testimony heard at the trial the child's life could have been saved if adequate medical management had supervened in time. The defendant was found guilty and sentenced to one year in jail and suspension of his license for three years. It is noteworthy that the court ordered the heilpraktiker into custody immediately following the conviction, apparently it was suspected that the man contemplated flight.

In another case a heilpraktiker was convicted of manslaughter in a Berlin court and sentenced to six months imprisonment. This man had as patient a woman affected with cancer of the breast, whom he treated with homeopathic medications over a long period. He had also advised the woman against visiting a doctor. When the patient finally came to surgical intervention the malignant condition was far advanced and she died. It is characteristic that in deciding on a relatively light punishment the court took into consideration that the convicted man had not previously been a defendant in any criminal proceeding.

An illuminating article on the problems of irregular medicine entitled *Improper Expert Testimony in Criminal Proceedings Against Quackery* has just appeared in the official *Deutsches Arzteblatt*. The author is Dr A. Hell, an eminent jurist who for many years has made a special study of medicolegal problems and of quackery in general. He points



out that convictions of quacks for fraud and for criminal negligence with fatal result to the patient are extremely difficult to obtain even when the guilt of the accused seems undoubted. This failure to convict is often due to introduction of unsatisfactory expert testimony by the prosecution as well as to the arbitrary and involved questions raised by expert testimony in general. As every one knows, even the most nonsensical alleged curative methods will not lack enthusiastic adherents. In a number of quackery trials, experts in the occult have been called on to defend the efficacy of occult therapeutics and these witnesses may even be licensed physicians. Then too the prosecution may call in as expert witnesses medical officials and other doctors who are inadequately prepared and unequal to the task, this deficiency on the part of the prosecution's witnesses often leads to a failure to convict even in proper cases.

In a case in point, a magnetic healer treated by telephone a child who ultimately succumbed to diphtheria. Placed on his trial for criminal negligence, the man was acquitted. The main thesis of his defense was that the absent treatment had actually increased the sick child's vitality and even effected temporary improvement in the general condition. The expert testimony of the local medical official was garbled in the extreme and this circumstance doubtless contributed to the outcome. Moreover, another medical witness (whose license has since been revoked) stated under oath that telephonic transmission of vital magnetism is in fact an effective therapeutic procedure even in diphtheria.

From the foregoing and other instances, Dr. Hellwig concludes that official medical experts and other doctors who are called on to testify in quackery trials ought to come into court better prepared. Above all, these experts should be in a position to express clear and unequivocal opinions which indicate that the problems involved have been considered from the standpoint of medical science.

News of the Profession

It has just been announced that the doctors of the Berlin Sick Insurance are to be guaranteed a minimal income by the official medical organization. Legitimate panel practitioners are hereafter assured of a total annual income of 1,000 marks. A doctor whose annual income falls below that amount may be granted the difference between his actual income and 1,000 marks. The practitioner himself must make application for this assistance; he will be required to furnish precise data concerning his total professional income and his private assets. The necessary funds for this aid are contributed by the more prosperous panel physicians. This is made feasible by the fact that the remittance of panel practitioners' honorariums is carried on by the Medical Organization. This New Year's present is intended to benefit only the so called German blooded doctors.

New restrictions have been placed on Jewish doctors, since the first of January they have been barred from practice in the so called Supplementary Clubs. The men affected were apprised of their exclusion only at the moment it became a fact. The membership of the Supplementary Clubs comprises chiefly clerical and industrial workers, who are less likely to be incapacitated than members of the Municipal Clubs, for example. Accordingly, panel practitioners in the Supplementary Clubs have been assured of a slightly better income. Even Jewish doctors who saw active service or who lost sons in the World War were not exempted from this expulsion. Jewish doctors have also been excluded from the welfare practice as well as from panel practice among the insurance clubs of postal employees and policemen, the big employees organizations of the Berlin Transportation Company and the Siemen Telegraph Company and in addition the insurance of the National Student Association and so on (some of these clubs had previously introduced similar restrictive measures). The new restrictions affect some 3,000 Jewish practitioners, about 800 of whom are in Berlin. Much

publicity had been given the circumstance that one third of the panel practitioners were still Jews and this led directly to enactment of the new restrictions.

Favorable Expansion of the Sickness Insurance

Provisional 1937 statistics for the aggregate of official Sick Insurance organizations indicate an excess of income over expenditure. The number of clubs declined somewhat during the year, there are now 4,598 such units. Total membership increased from 19,400,000 to 22,900,000. Official circles are now attempting to place all Sick Insurance more within the scope of national-political economics. For example, insurance club members with large families are to be eligible for more substantial benefits without any additional contributions being required of them.

Just released by the National Bureau of Statistics are some figures on Sickness Insurance disbursements during the year

Sickness Insurance Disbursements During 1935

Medical and dental treatment	461 000 000 marks
Therapeutic substances and appliances hospital care and convalescent care	324 000 000 marks
Care of members dependents	97 000 000 marks
Cure during confinement	110 000 000 marks
Prophylaxis and hygiene	5 500 000 marks

1935. These statistics, shown in the accompanying table, represent in round numbers the amounts paid out for various purposes by the clubs under direct governmental control, by the Miners' Clubs and by the Supplementary Clubs.

Thus exclusive of the cash benefits paid to members and the costs of administration around 998,000,000 marks was expended by the Sickness Insurance in 1935. It is estimated that the expenditures during 1936 were about 4 per cent greater than in 1935.

JAPAN

(From Our Regular Correspondent)

Jan 27, 1938

Prevention of Venereal Disease in Tokyo

The Metropolitan Police Board reports as follows on the preventive measures it applies continually to the licensed and unlicensed prostitutes and to the geisha girls. The licensed prostitutes who are confined in restricted quarters are examined once a week and any with venereal disease must enter a hospital attached to this office. The brothels are inspected every month by the police, and a member of the sanitary committee goes round for inspection. He spares no efforts to aid the keepers in how to improve their equipment. Occasionally a lecture on the prevention of this disease is given by an expert to the prostitutes. Generally speaking, any order given by the police is obeyed. There has been a remarkable decrease of infection in these quarters. The "geisha girls" who are singers and dancers are sometimes little better than the prostitutes; they also are advised, though not compelled by the police to have a regular examination at their own will or by the agreement of their unions, which number seventy in all in Tokyo. Sixty eight unions have their own doctors, but still the result is not good enough. Two venereal disease prevention parties were recently formed by the metropolitan police board, whose duty it is to teach health to those women. The society for the prevention of venereal disease has a group that goes round the city to exhibit moving pictures which give citizens an insight into the prevention of venereal disease.

Preservation of Vaccine Lymph

In November at the Infectious Disease Research Institute in Tokyo a paper was read by Dr. Yaoi on the preservation of vaccine lymph. He is mentioned as a probable candidate for the prize of the Imperial Academy for 1937. He said: The



purified vaccine matter as well as the common matter can hardly remain effective over half a month in summer temperature. As for the vessel in which to keep the lymph, the brown one used widely, which is colored with iron, is very harmful, but the brown ampule made of carbon is innocuous. Concerning temperature, the lymph can remain effective for a week in summer when the temperature is 86 F, which temperature is the highest one on an average in Tokyo and its vicinity. It is effective for a month when the temperature varies between 63 and 68°

### New Welfare Department

The present cabinet announced last July the establishment of the department for the promotion of the public welfare. Originally the establishment of this office was proposed by the war office and it was at first to be called the health office. The appearance of this office is an epoch-making change, for it aims to bring all government administration of sanitation under a single authority. At its opening, January 11, Prince Konoe, the prime minister, said he was greatly pleased to have an office to unify the affairs of national health, labor and social reform. The office aims to strengthen and extend the former administrations, and the chief aim should be to raise the level of the nation's health. Marquis Kido, minister of education, was appointed to be minister of welfare as an additional office for the time being. The new office has five bureaus of physical training, sanitation, social welfare and labor, and an independent bureau of life insurance is attached to it. It was established at an estimated cost of \$25,000,000 for the coming fiscal year.

### Prevention of Mental Diseases

The Association of the Mental Homes of Japan held its sixth general meeting in November and passed a resolution to be presented to the minister of home affairs to recommend methods for prevention of mental disease. Almost at the same time the Japan society of mental diseases made a similar proposal to the government as an urgent necessity, judging from the present state of society. Prevention, first of all, requires more hospitals, for at present only 6 per cent of the cases can be accommodated. As the causes of mental diseases are to be the subject of research, there must be established on a large scale a mental disease research institute by the government. An office where parents can consult the alienist about their children should be founded by the government at as many places as possible throughout the country.

## Marriages

SNOWDEN C. HALL JR., Danville, Va., to Miss Ida Shankle Hardman of Commerce, Ga., in December 1937.

EDWARD CARLISLE JOINER, Suffolk, Va., to Miss Ruth Elizabeth German of Richmond, Dec. 6, 1937.

KENNETH E. STEIN, Lakeville, Minn., to Miss Mary Phyllis Baudin of Minneapolis, Aug. 24, 1937.

HERBERT SHERWIN, Fall River, Mass., to Miss Delle Silverman of Cambridge in August 1937.

ALBERT ALLEN to Miss Mildred Soncrant, both of San Pedro, Calif., in Yuma, Ariz., January 1.

HENRY A. BELLAFSKY, Woodbridge, N. J., to Miss Rose Buckner of Newark, January 2.

ALBERT E. LONG, Charlottesville, Va., to Miss Lois Nichols at Lynchburg, Dec. 27, 1937.

HAROLD W. SHUTTER to Mrs. Gazelle Christman, both of Milwaukee, Nov. 23, 1937.

PAUL SADLER KEMP, Macon, Ga., to Miss Mildred Burnley of Augusta, January 6.

JULIUS ROOS, Chicago, to Miss Gretel Marx of Flonheim, Germany, recently.

## Deaths

**James Lancelot Minor**, Cordova, Tenn., University of Virginia Department of Medicine, Charlottesville, 1876, member of the Tennessee State Medical Association, emeritus professor of ophthalmology, University of Tennessee College of Medicine, Memphis, member of the American Ophthalmological Society, fellow of the American College of Surgeons, served during the World War, formerly on the staffs of the Memphis Eye, Ear, Nose and Throat Hospital, St. Joseph's Hospital Baptist Hospital and the Memphis General Hospital, aged 83, died, Dec. 3, 1937.

**William Charles McLaughlin**, Providence, R. I., Harvard University Medical School, Boston, 1905, member of the Rhode Island Medical Society, New England Ophthalmological Society and the New England Otolological and Laryngological Society, fellow of the American College of Surgeons, on the staffs of the Charles V. Chapin Hospital, Providence City Hospital, Rhode Island Hospital and St. Joseph's Hospital, aged 57, died, Dec. 6, 1937, of duodenal ulcer and dilatation of the heart.

**George Hoskins Scott**, Colonel, M. C., U. S. Army, Fort Slocum, N. Y., University of Pennsylvania Department of Medicine, Philadelphia, 1902, member of the House of Delegates of the American Medical Association in 1933, entered the army as an assistant surgeon in 1902, was promoted through the various grades to that of colonel in 1928, fellow of the American College of Surgeons, aged 58, was found dead, Dec. 13, 1937, in Detroit, of carbon monoxide poisoning.

**Walter Herbert Blakeslee**, Philadelphia, Johns Hopkins University School of Medicine, Baltimore, 1901, at one time physician to the State Department of Labor and Industry and the Workmen's Compensation Board, formerly on the staff of the Episcopal Hospital, aged 66, died, Dec. 13, 1937, in the Temple University Hospital, of left inguinal hernia and thrombosis.

**Charles Ulysses Moore**, Portland, Ore., University of Minnesota College of Medicine and Surgery, Minneapolis, 1910, fellow of the American College of Physicians, served during the World War, on the staff of the Multnomah Hospital, author of "Nutrition of Mother and Child", aged 60, was found dead, Dec. 21, 1937, of accidental carbon monoxide poisoning.

**Dan Smith Renner**, Skillman, N. J., University of Louisville (Ky.) Medical Department, 1909, past president of the Somerset County Medical Society, member of Medical Society of New Jersey and the American Psychiatric Association, superintendent of the New Jersey State Village for Epileptics, aged 53, died, Dec. 13, 1937, of coronary thrombosis.

**William Worthington Samuel**, Dallas, Texas, Tulane University of Louisiana Medical Department, New Orleans, 1901, fellow of the American College of Surgeons, served during the World War, on the staffs of the Baylor University, Dallas Methodist and St. Paul's hospitals, aged 59, died, Dec. 12, 1937, in a local hospital, of coronary occlusion.

**H. Christian U. Midelfart**, Eau Claire, Wis., Kongelige Frederiks Universitet Medisinske Fakultet, Oslo, Norway, 1892, fellow of the American College of Surgeons, on the staffs of the Lutheran and Sacred Heart hospitals, aged 72, died, Dec. 14, 1937, of coronary sclerosis, chronic myocarditis, mitral insufficiency and bilateral cystic kidneys.

**Frank Harold McLaury**, New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895, served during the World War, medical director of the Chase National Bank, aged 64, died Dec. 8, 1937, in the New York Post-Graduate Medical School and Hospital of coronary thrombosis.

**William Griggs Marsh**, Watsonstown, Pa., University of Pennsylvania Department of Medicine, Philadelphia 1877, member of the Medical Society of the State of Pennsylvania for many years, member of the school board and board of health, aged 85, died, Dec. 29, 1937, of chronic endocarditis, nephritis and arteriosclerosis.

**George Malcolm Graham**, Austin, Texas, University of Texas School of Medicine, Galveston 1912, for many years director of laboratories for the state department of health, served as pathologist to the Seton Infirmary and St. David's Hospital, aged 51, died, Dec. 25, 1937, in a local hospital, of encephalitis.

**Martin Joseph Patrick**, Shenandoah, Pa., Temple University School of Medicine, Philadelphia 1910, member of the Medical Society of the State of Pennsylvania, for many years

member of the local board of health, on the staff of the Locust Mountain Hospital, aged 52, died, Dec 9, 1937, of coronary thrombosis

**Felix Summerfield Martin**, Beaumont Texas, Barnes Medical College, St Louis, 1894, past president of the Jefferson County Medical Society, formerly connected with the Indian Service, aged 67, died, Dec 23, 1937, in a local hospital, of coronary thrombosis, diabetes mellitus and arteriosclerosis

**Arthur Levan Page** ♂ Harrisburg, Pa, Jefferson Medical College of Philadelphia, 1907, member of the American Academy of Pediatrics, aged 54, on the staffs of the State Hospital for Crippled Children Elizabethtown, and the Harrisburg Hospital, where he died, Dec 22, 1937, of arteriosclerosis and nephritis

**Ford Eastman** ♂ Erie, Pa, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908, fellow of the American College of Surgeons, past president of the Erie County Medical Society, on the staff of the Hamot Hospital, aged 59, died suddenly Dec 28 1937, of cerebral hemorrhage

**Walter James Miller**, Johnson City, Tenn, Vanderbilt University School of Medicine, Nashville, 1877, member of the House of Delegates of the American Medical Association in 1903, 1905 1906, past president of the state board of health, aged 82, died, Dec 14 1937, of carcinoma of the larynx

**John H Dripps**, Philadelphia, Jefferson Medical College of Philadelphia, 1878, member of the Medical Society of the State of Pennsylvania, for many years on the staff of the Stetson Hospital, aged 80, died, Dec 20, 1937, of arteriosclerosis, pyelonephritis and coronary embolism

**Harvey Leander Kennedy**, Ottawa Kan, Kansas Medical College, Medical Department of Washburn College, Topeka, 1903, member of the Kansas Medical Society past president and secretary of the Franklin County Medical Society, aged 68, died, Dec 28, 1937, of coronary disease

**Oscar Benjamin Millard**, Harrisburg, Pa, Jefferson Medical College of Philadelphia, 1928, member of the Medical Society of the State of Pennsylvania, on the staff of the Harrisburg Polyclinic, aged 36, died, Dec 29, 1937, of injuries received when struck by an automobile

**William Armitage Moncrieff** ♂ New Bedford, Mass, Tufts College Medical School, Boston, 1913, member of the New England Otological and Laryngological Society, served during the World War, aged 47, died, Dec 18, 1937, of tuberculosis of the lungs and larynx

**Homer Hill Lewis** ♂ Clearfield Pa, University of Louisville (Ky) Medical Department 1909, served during the Spanish American and World wars, formerly county coroner, aged 59, on the staff of the Clearfield Hospital, where he died, Dec 18, 1937, of coronary occlusion

**William Beach Morrow**, Walton, N Y, Bellevue Hospital Medical College, New York 1881, member of the Medical Society of the State of New York, past president of the board of education, aged 79 died, Dec 18, 1937, of cerebral hemorrhage and chronic nephritis

**William Scott Piper** ♂ Clearfield, Pa, Hahnemann Medical College and Hospital of Philadelphia 1904, served during the World War, fellow of the American College of Surgeons, on the staff of the Clearfield Hospital, aged 55, died, Dec 15, 1937 of coronary occlusion

**James Melvin Little**, Sterling, Kan, Western Reserve University Medical Department, Cleveland, 1898, member of the Kansas Medical Society, formerly mayor of Sterling, president of the county board of health, aged 65, died, Dec 27, 1937, of heart disease

**Joseph B Champion**, Montoursville Pa Medical College of Indiana Indianapolis, 1898, veteran of the Spanish American War at one time a lawyer, aged 70 died Dec 13 1937, in the Danville (Pa) State Hospital of cerebral arteriosclerosis and coronary occlusion

**John Emerson Hunter**, Greenville Ohio, Cincinnati College of Medicine and Surgery 1891, member of the Ohio State Medical Association and the Associated Anesthetists of the United States and Canada, aged 76, died, Dec 29, 1937, in Alexandria La

**Emanuel Norman Martin** ♂ Clay Center Kan University Medical College of Kansas City, Mo 1900 past president and secretary of the Clay County Medical Society county health officer, aged 63 died Dec 16, 1937, in Halstead of carcinoma

**Arthur Daniel Morgan** North S C Medical College of the State of South Carolina Charleston, 1890, served during

the World War, aged 71, died, Dec 31, 1937, in the Veterans Administration Facility, Columbia, of lobar pneumonia and arteriosclerosis

**Louis Edwin Jones** ♂ Prescott, Wis, University of Minnesota Medical School, Minneapolis, 1924, medical director and owner of St Crowdale Sanatorium, aged 40, died, Dec 28 1937, of cerebral hemorrhage, coronary occlusion and arteriosclerosis

**Herman David Jerowitz** ♂ Kansas City, Mo, University Medical College of Kansas City, Mo 1891 an Affiliate Fellow of the American Medical Association, on the staff of the Menorah Hospital, aged 68, died, Dec 24, 1937, of heart disease

**George Watson Barnett**, Johnstown, Pa, Jefferson Medical College of Philadelphia, 1908, fellow of the American College of Surgeons, veteran of the Spanish-American War, aged 60, died, Dec 17, 1937, of pulmonary embolus and heart disease

**Robert Allen McCurdy**, Eldorado, Kan, University of Kansas School of Medicine, Kansas City, 1933, member of the Kansas Medical Society, aged 29, died, Dec 15, 1937, in the Temple University Hospital, Philadelphia, of carcinoma

**David Gillison Wells**, McHenry, Ill, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898, aged 68, died, Nov 26 1937, in Los Angeles, of gastric hemorrhage and acute dilatation of the heart

**Walter August Day**, Alton, Ill, Bennett Medical College, Chicago, 1914, served during the World War, aged 47, on the staff of St Joseph's Hospital, where he died, Dec 30, 1937, of hypostatic pneumonia and cardiorenal vascular disease

**Edwynn J Oxford**, Chambers, Neb, John A Creighton Medical College Omaha, 1905, member of the Nebraska State Medical Association, aged 55, died Dec 7, 1937, in St Joseph's Hospital, Omaha, of arteriosclerosis and heart disease

**Charles La Forge Manning**, Philadelphia, Jefferson Medical College of Philadelphia, 1903, member of the Medical Society of the State of Pennsylvania formerly a druggist, aged 67, died, Dec 20 1937, of coronary occlusion

**Frank M McCafferty** ♂ Toledo, Ohio, Ohio Medical University, Columbus, 1895, on the staff of the Toledo State Hospital, at one time demonstrator of obstetrics at his alma mater, aged 71, died, Dec 14, 1937, of pneumonia

**William Evans**, Norfolk, Va, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890, member of the Medical Society of Virginia, aged 70, died, Dec 26, 1937, of angina pectoris

**Guy Andrew Darcantel** ♂ White Castle La Tulane University of Louisiana School of Medicine New Orleans, 1900, aged 59 died, Dec 20, 1937, at the Plaquemine (La) Sanitarium, of subacute bacterial endocarditis

**John Decker Butzner** ♂ Scranton, Pa, University of Virginia Department of Medicine Charlottesville 1904 served during the World War, aged 59, died, Dec 23, 1937, in the Mercv Hospital, of intestinal obstruction

**Isaac Foster Harter** ♂ Stronghurst Ill College of Physicians and Surgeons Keokuk, Iowa, 1877, formerly druggist postmaster and member of the board of school trustees, aged 86, died, Dec 25, 1937, of pneumonia

**Lynn A Carden**, Pelham, Tenn, University of Tennessee Medical Department, Nashville, 1891 member of the Tennessee State Medical Association, aged 77, died, Dec 22, 1937, of hypostatic pneumonia

**Harry M Bunting**, Norristown Pa, Hahnemann Medical College of Philadelphia 1879, member of the Medical Society of the State of Pennsylvania, aged 79, died, Dec 22, 1937, of coronary thrombosis

**Samuel Itscowitz**, McKeesport Pa, Fordham University School of Medicine, New York 1915 served during the World War, aged 46 died, Dec 7, 1937, of arteriosclerosis and cerebral hemorrhage

**Aubrey Russell Greenlee**, Kansas City Mo University Medical College of Kansas City 1892, member of the Missouri State Medical Association, aged 66, died, Dec 4, 1937, of coronary thrombosis

**Barton T McDowell** ♂ Bristol Center, N Y University of Buffalo School of Medicine 1892 district director of school hygiene, aged 70 died Dec 27 1937, of heart disease and duodenal ulcer

**Willis Le Forest Gatchell**, Stockton, Calif, Medical School of Maine Portland 1882 member of the California Medical Association, aged 82, died Dec 31, 1937, of carcinoma of the prostate

**Murphy M Morrison**, Demson, Texas, Chattanooga (Tenn.) Medical College, 1893, served during the World War, aged 65, died in December 1937, of nephritis and cerebral hemorrhage

**Emmett L Merrill**, Turin, Ga., Vanderbilt University School of Medicine, Nashville, Tenn., 1890, aged 69, died, Dec 1 1937, in the Newman (Ga.) Hospital, of coronary artery thrombosis

**Florence Sharp Manion**, Portland, Ore., American Medical College, St. Louis, 1895, aged 72, died suddenly, Dec 16, 1937, in the Good Samaritan Hospital, of coronary thrombosis

**Louis Laurenzana** ☉ Kansas City, Mo., Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1894, aged 67, died Dec 11, 1937, in Rome, Italy, of coronary thrombosis

**Myron J Brooks**, New Canaan, Conn., Rush Medical College, Chicago, 1897, formerly medical examiner and health officer, aged 69, died, Dec 10, 1937, in Honolulu, Hawaii

**Thomas Teasdale Mutchler**, Philadelphia University of the City of New York Medical Department, 1872, also a minister, aged 87, died, Dec 13, 1937, of chronic myocarditis

**James William Parsons**, Canton, Pa., University of the City of New York Medical Department, 1880, aged 81, died, Dec 6, 1937, of organic heart disease and diabetes mellitus

**John Mann Creswell**, Searcy, Ark., St. Louis College of Homeopathic Physicians and Surgeons, 1882, aged 80, died, Dec 28, 1937, of aortic insufficiency and chronic nephritis

**J Paul Chambers**, Philadelphia, Georgetown University School of Medicine, Washington, D. C., 1884, aged 80, died, Dec 15, 1937, of chronic myocarditis and arteriosclerosis

**Clarence Carson Parks**, Leechburg, Pa., Jefferson Medical College of Philadelphia, 1906, served during the World War, aged 57, died, Dec 12, 1937, of coronary occlusion

**Wellington Henry Merriman**, Poland, N. Y., Queen's University Faculty of Medicine, Kingston Ont., Canada, 1895, aged 70, died, Dec 1, 1937, of acute pyelonephritis

**Oscar Franklin Portwood**, Pasadena, Texas, University of Georgia Medical Department, Augusta, 1904, aged 57, died, Dec 22, 1937, of pneumonia and acute polyarthritis

**Homer Seal McCoy**, Sylvester, Ga., Atlanta Medical College, 1914, member of the Medical Association of Georgia, aged 54, died, Dec 31, 1937, in an automobile accident

**Walter Henry Darling**, Minneapolis, University of Minnesota Medical School, Minneapolis, 1895, aged 64, died, Dec 6 1937, in Anoka, Minn., of coronary thrombosis

**Baron Ross Nairn**, Buffalo, University of Buffalo School of Medicine, 1895, served during the World War, aged 63, died Dec 3, 1937, of carcinoma of the stomach

**William H Hodges**, Watkinsville, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890, aged 66, died, Dec 9, 1937, of heart disease and arteriosclerosis

**Leo Frank Adt**, Albany, N. Y., Albany Medical College, 1892, on the staffs of the Albany Hospital and St. Peter's Hospital, aged 71, died Dec 3, 1937, of pneumonia

**Lafayette Noe**, Queen City, Mo., College of Physicians and Surgeons, Keokuk, Iowa, 1897, formerly county judge, aged 69, died suddenly, Dec 19, 1937, of myocarditis

**J C Jones**, Buffalo, Ky., Louisville (Ky.) Medical College, 1889, aged 85, died Dec 7, 1937, in Bunnell, Fla., of chronic nephritis, myocarditis and cerebral hemorrhage

**Edward Seymour Moulton**, Alameda, Calif., Yale University School of Medicine, New Haven, Conn., 1894, aged 69, died Dec 30, 1937, of nephritis and cystitis

**Thomas C Harris**, Centralia, Va. (licensed in Virginia in 1899), member of the Medical Society of Virginia, aged 61, died Dec 6 1937, of cerebral hemorrhage

**George Sheryl Cabot** ☉ Jamestown, N. D., University of Minnesota Medical School, Minneapolis, 1924, aged 38, died, Dec 16, 1937, of ventral hernia and ileus

**Alonzo Leaming Bushby**, Los Angeles, College of Physicians and Surgeons of Chicago, 1891, aged 71, died, Nov 13, 1937, of arteriosclerosis and myocarditis

**John Rushing Jackson**, Hattiesburg, Miss., Medical College of Alabama Mobile, 1890, aged 82, died, Dec 25, 1937, of coronary embolism and arteriosclerosis

**Carl Herbert Bryant**, Atascadero, Calif., Johns Hopkins University School of Medicine, Baltimore, 1908, aged 56, died, Dec 22 1937, of coronary occlusion

**Benjamin F Cline**, Orange, N. J., University of Virginia Department of Medicine, Charlottesville, 1898, aged 65, died Dec 9 1937, of coronary occlusion

**William Nathaniel Leedom**, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1892, aged 73, died, Dec 11, 1937, of gastric ulcer

**John Burling**, Summit, N. J., Homeopathic Hospital College, Cleveland, 1874, aged 95, died, Dec 18, 1937, of coronary sclerosis and chronic myocarditis

**Arthur Clinton Helm**, Beloit, Wis., Chicago Medical College, 1884, aged 80, died, Dec 24, 1937, of cerebral hemorrhage and arteriosclerotic hypertension

**Donald Edmund McKenty**, Winnipeg, Manit., Canada, Manitoba Medical College, Winnipeg, 1911, aged 67, died, Dec 3, 1937, of coronary thrombosis

**Lawrence S Higdon**, Clarkson, Ky., Kentucky University Medical Department, Louisville, 1905, aged 61, died, Dec 3, 1937, in an automobile accident

**Frederick Christian Joesting** ☉ Alton, Ill., Washington University School of Medicine, St. Louis, 1901, aged 59, died, Dec 22, 1937, of heart disease

**John Agnew Hayes** ☉ Philadelphia, Temple University School of Medicine, Philadelphia, 1910, aged 67, died, Dec 12, 1937, of cerebral thrombosis

**Franklin Wiley Lester** ☉ Marionville, Mo., Homeopathic Medical College of Missouri, St. Louis, 1900, aged 68, died, Dec 14, 1937, of pneumonia

**Maximilian Arthur Auerbach**, New York, Illinois Medical College, Chicago, 1899, aged 63, died, Nov 15, 1937, of tubes dorsalis and pyelonephritis

**John Harrison Fuller**, Wichita, Kan., Kentucky School of Medicine, Louisville, 1881, aged 78, died, Dec 24, 1937, of carcinoma of the larvix

**William Hiram Mitchell**, Boston, Medical School of Maine, Portland, 1899, aged 68, died, Nov 26, 1937, of coronary sclerosis and thrombosis

**James R Hawkins**, Pelly, Texas, University of Louisville (Ky.) Medical Department, 1881, aged 82, died, Dec 30, 1937, of cerebral hemorrhage

**George A Coble** ☉ New Augusta, Ind., Medical College of Indiana, Indianapolis, 1882, aged 76, died, Dec 31, 1937, of coronary thrombosis

**David W Cole**, Gelatt, Pa., Baltimore University School of Medicine, 1892, aged 74, died, Dec 16, 1937, of cardiovascular renal disease

**William G Korony**, Anchorage, Ky., Hospital College of Medicine, Louisville, 1903, aged 54, died, Dec 26, 1937, of cerebral hemorrhage

**James Edward Asbury**, Los Angeles, Meharry Medical College, Nashville, Tenn., 1882, aged 85, died, Nov 26, 1937, of chronic nephritis

**Charles Augustin Edelen**, Louisville, Ky., Kentucky School of Medicine, Louisville, 1904, aged 58, died, Dec 13, 1937, of pneumonia

**Sanders P Jethrew Lee**, Dunn, N. C., Maryland Medical College, Baltimore, 1904, also a dentist, aged 64, died, Dec. 11 1937, of uremia

**Charles Lazarus Henkin**, Greenpoint, N. Y., Boston University School of Medicine, 1912, aged 52, died, Dec 19, 1937, of heart disease

**John Wesley Irvin**, Wooster, Ohio, Jefferson Medical College of Philadelphia, 1886, aged 77, died, Dec 20, 1937, of arteriosclerosis

**Louis Wilhelm Juergens**, Milwaukee, Rush Medical College, Chicago, 1888, aged 79, died, Dec 2, 1937, of chronic nephritis

**Henry Lee Howard**, Savannah, Ga., Southern Medical College, Atlanta, 1881, aged 78, died, Dec 13, 1937, in a local hospital

**Almon De Bois Gay**, Boston, Harvard University Medical School, Boston, 1875, aged 87, died, Dec 31, 1937, of pneumonia

**Harriet Warner Carman**, Los Angeles, Cleveland Medical College, 1892, aged 90, died, Nov 26, 1937, of chronic myocarditis

**Ida Valeria Beers** ☉ Denver, Gross Medical College, Denver, 1901, aged 67, died, Dec 9, 1937, of chronic myocarditis

**Charles A Gillette**, Brewerton, N. Y., Albany Medical College, 1883, aged 82, died Dec. 15, 1937, of pneumonia

**John Ewing**, Glendale, Calif., Chicago Homeopathic Medical College, 1895, aged 70, died, Dec 21, 1937, of nephritis

## Correspondence

### RESUSCITATION OF THE NEW-BORN

*To the Editor*—In a communication to THE JOURNAL, January 22 page 304, Prof Yandell Henderson apparently erred inadvertently as to what constitutes the Flagg technic in initiating respiration in the new born. This technic is not the insufflation of oxygen deeply into the trachea under conditions which permit a free escape of the gas but is such an insufflation with the escape of the gas so controlled that the lungs are alternately inflated and partially deflated by varying the intrapulmonary pressure caused by the volume of insufflated oxygen (Flagg P. J. Art of Anesthesia, ed 5, p 391).

The work of Meltzer (THE JOURNAL, May 10, 1913, p 1407) showed that the blood could be oxygenated without respiratory effort of the subject when the amount of insufflated air or oxygen was sufficiently large. But in all these subjects the lungs had been previously expanded in physiologic use for a long period and during this insufflation the lungs were kept inflated on account of the increased intrapulmonary pressure.

In asphyxia neonatorum on the other hand, the lungs are collapsed. Aside from respiratory effort of the subject, there has been no way suggested for oxygenating the blood that does not involve an artificial increase in intrapulmonary pressure which expands the collapsed alveoli.

Just how high the intrapulmonary pressure in the infant may be safely raised is a question on which there is a difference of opinion. But as a matter both of information and of caution it may be stated that this is not very high.

RAYMOND C. COBURN, M.D., New York

### COUNTER AND RADIO PRESCRIBING

*To the Editor*—In THE JOURNAL, January 22, is an editorial comment on counter prescribing which emphasizes what is common knowledge that counter prescribing by clerks in drug stores is both flagrant and constant, though many of them have not the excuse (?) of being pharmacists.

No comment has ever been made by any one to my knowledge at least of an equally constant and equally flagrant nuisance, namely, "radio prescribing." Many programs, in their commercial broadcasts, recite a varied list of symptoms followed by a recommendation to take the particular product in question according to the directions at once given in detail. Of course in some few instances there is also a recommendation to see your doctor, which is more than offset by the eminent (though anonymous) group of scientists or "eminent doctors" whose investigations have proved the remarkable value of the product in question.

ROBERT A. KILBUFFE, M.D. Atlantic City

### PRURITUS ANI

*To the Editor*—In his article on pruritus ani (THE JOURNAL, February 12 p 509) Dr Howard Lilienthal describes a simple cleansing and protective method as commonly prescribed for the anal region by proctologists; this method is not confined to pruritus ani particularly. He suggested that dirt or fecal contamination accounted for the so called pruritus.

The fact that thousands of people under exactly the same conditions as described do not develop pruritus ani is evidence in my opinion against his theory.

His simple method is more misleading. Pruritus ani is not so simple as an immense amount of research over many years has disclosed. The condition is a symptom and the etiology

is commonly undiscovered. Allergic manifestations offer much promise in individual cases of identifying the cause. A large percentage of cases of pruritus ani are allergic to the fungi and these are remediable. Food allergic manifestations in the perianal region are not unusual, and a common food is the grape in its various forms, such as wine or brandy. Pruritus ani is an open field for much further investigation.

The modern surgical method of perianal subcutaneous neurectomy which Dr Lilienthal refers to as a formidable procedure is, when expertly done, very simple, requiring about five minutes. This breaks the vicious circle of itching and scratching with the resulting secondary infection, and allows such local and systemic treatment as may be indicated.

E. G. MARTIN, M.D., Detroit

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### ALLERGY TO HORSEHAIR

*To the Editor*—A boy aged 4 has had an almost constant watery nasal discharge since he was a few months old, more severe in the winter and when outdoors and when the window of the bedroom is open at night (in winter). When on several occasions he has been close to horses he has reacted with sneezing and conjunctivitis. He has no history of any dermatitis or allergic reactions to any known stimulus. The tonsils and adenoids have been removed. Scratch tests show a reaction to horsehair and to nothing else. There are many articles of furniture in the house containing horsehair. What is the probability of the rhinitis being due to horsehair allergy? If it is not due to horsehair what treatment should be tried? Is horsehair in a mattress or pillow just as potent an allergen as when on a horse? M. D. Vermont

ANSWER—From the history given and the positive scratch test to horsehair it is almost certain that the rhinitis is due to horse dander. Experience has shown that a positive test to horse dander is very apt to be associated with clinical symptoms. This is especially true when the positive reaction is by the cutaneous or scratch method, as this method, when positive, indicates a much greater degree of hypersensitivity than the intradermal method of testing. Treatment should consist of as rigid avoidance of horse dander as is possible. All horsehair in the house should be removed, the contents of couches, mattresses, pillows and carpet pads should be investigated, some long hair brushes are made of horsehair. Felt hats, automobile paddings, colts and pony skins and manure must also be considered. It is, of course, essential to avoid horses, horse shows, stock shows and polo games, residence near a stable may be associated with sufficient exposure to cause symptoms. Sensitive individuals must avoid not only horses and stables but also all persons or objects, such as a riding-habit directly or indirectly connected with the handling of horses.

Hyposensitization to horse dander would seem advisable as it is almost impossible to avoid horsehair and horse dander completely. If avoidance does not remove symptoms in a few weeks the child should be given injections of an extract of horse dander. The initial dosage should be small, perhaps 0.1 cc. of a 1:1000,000 extract, increases should be gradual from 40 to 50 per cent each dose, local reactions demand caution. The top dosage varies but many patients can reach a 1:1000 or a 1:100 dilution with safety and good results.

Horsehair in a mattress or pillow, if properly sterilized should not be as potent an allergen as when on a horse and yet it is impossible to destroy an antigen completely except by a more prolonged sterilization than is customary nor can one wash all the dander out of horsehair. Therefore horsehair mattresses can cause symptoms in all but the least sensitive individuals. Cold air or exertion may aggravate symptoms.

It might be well also to caution against the use of horse serum in this child as almost all individuals who are sensitive to horse dander are sensitive also to horse serum. The use of diphtheria and tetanus antitoxin should call for extreme caution. Precautions can be found in any textbook on allergy.

## PAIN IN HIP AND LEG

*To the Editor*—Can you suggest treatment for an intractable case of what has been provisionally diagnosed as toxic neuritis and fibrositis of the lower limb? The patient is 73 years of age. Pain in the hip first began in January 1937 and was accompanied by pain in the right humerus. The prostate was enlarged but there was no residual urine. In view of the possibility of malignancy, a complete examination was made including x-ray examination of the long bones and pelvis but everything was normal. The basal metabolic rate was -10. Prostatectomy was performed in two stages the second operation three weeks after the first. The patient was discharged from the hospital eight weeks later with healthy bladder and a full stream of urine. The pathologic report was that there were two fibroadenomatous growths in the prostate and no malignant condition. During the time the bladder was draining there was no pain in the limb but when drainage ceased and the suprapubic wound healed pain returned with increased intensity and now after two months the pain is as severe as ever so that there is no rest at night. Temporary relief can be obtained by sitting up. The nature of the pain is that it recurs in waves of intensity in the gluteal region and from the knee to the ankle over the region supplied by the external popliteal nerve. The muscles are sensitive in this region and the cutaneous reflex is increased. The skin is sensitive to the sun's rays which cause erythema and severe itching. A half minute's exposure to the quartz lamp at a distance of 25 inches caused a severe reaction. The neurologist's report of the nervous system is negative except for the limb. The only x-ray evidence is an old arthritis of the lumbar spine and productive change in the first and second lumbar vertebrae with a bony bridge joining the two but that condition has been present for ten years without inconvenience. The treatment so far adopted has been fifteen minutes daily with the inductotherm for a week, infra red application the quartz lamp for two applications and a superimposed wave (McIntosh machine) five minutes daily for a week with high voltage roentgen therapy over the lumbar spine for eight daily treatments, each being for six minutes at 50 cm. 20 milliamperes, filtered through 1 mm. of copper and 3 mm. of aluminum. The x-rays seemed to give some relief but all other treatments failed. Massage seemed to help. I should be glad of any suggestions that might help.

M D Newfoundland

*ANSWER*—The treatment thus far instituted is empirical and is carried on in line with what would be recommended for fibrositis, neuritis and arthritis. The fact that the x-rays seem to give the most relief may be of some significance. Pain from a malignant growth is usually relieved temporarily by roentgen treatment. Unfortunately, some patients on whom prostatectomy has been done, although no malignant condition could be demonstrated in the specimen, have later died of multiple metastases to the bone. This must not be lost sight of in this patient.

Treatment will have to be symptomatic, with such drugs as are necessary to relieve pain, but opiates should be avoided as much as possible. If the pain should be due to a malignant condition it will become steadily worse and opiates will have to be used in increasing amounts. Therefore they should be administered only when really needed. If the dose is increased, not only will the patient suffer from the systemic effects of large doses of the narcotic but a tolerance to the drug will develop and the pain will not be controlled even by huge doses. It is extremely unlikely that the pain would have been caused by any damage occurring from the spinal anesthetic.

## ASCENDING NEURITIS

*To the Editor*—The tenth edition of Osler's Practice of Medicine states on page 1050: "A neuritis limited at first to a peripheral nerve may extend upward—the so called ascending or migratory neuritis—and involve the larger nerve trunks or even reach the spinal cord—causing subacute myelitis (Gowers). The condition is rarely seen in the neuritis from cold or in that which follows fevers but it occurs most frequently in traumatic neuritis. Is this statement regarded as true? All the neurologists I have spoken to about this deny that such a thing is possible. Kindly supply me with references."

M D New York

*ANSWER*—Gowers (A Manual of Diseases of the Nervous System, vol. 1, Diseases of the Spinal Cord and Nerves, London, J. & A. Churchill, 1886). "Migrating neuritis" is not rare in man and is readily produced in animals. It may reach the spinal cord and there produce various disturbances. The inflammation may spread in the tissues outside the dura mater or may extend to the cord and cause subacute or chronic myelitis with or without meningitis (p. 57). The condition is much rarer, however, than Gowers supposed. Oppenheim (Textbook of Nervous Diseases for Physicians and Students, ed. 5 translated by Alexander Bruce, vol. 1, London and Edinburgh, T. N. Foulis, 1911) says: "The neuritis ascendens or migrans, which plays a great part in earlier literature, is rare. Experimental investigations have shown that an artificially produced suppurative inflammation of the nerves may ascend along the nerve and may advance intermittently in a centripetal direction" (p. 419). In a footnote Oppenheim states: "In the great majority of cases shown to me as ascending neuritis I have found that there was not a neuritis but a traumatic neurosis or hysteria; there were only two or three in which a true ascending neuritis seemed to exist, as in one case in which a mucospiral

paralysis followed a slight wound of the finger." In this case, however, influenza had also previously been present. In general, the French neurologists Dejerine and Raymond upheld the position of an infective form of ascending neuritis, which even reached the spinal cord.

Up to the time of the World War, therefore, ascending neuritis was certainly rarely found, although occasionally traumatic cases have been described. Tinel (Nerve Wounds, Symp. tomatology of Peripheral Nerve Lesions Caused by War Wounds, New York, William Wood & Co., 1917), who had a large experience with peripheral nerve lesions, found definite cases, although the condition was rare. The condition is characterized "by the fact that the traumatized nerve not only degenerates rapidly toward its peripheral extremity but undergoes a slow, progressive ascending degeneration of its central segment" (p. 81). He found that it was most frequently the result of a focus of bony suppuration. When the condition is severe, it usually continues for months and sometimes years, seldom stopping before reaching the plexus and the spinal cord itself. Tinel found that section of the nerve above the lesion, or even amputation of the limb itself, was not always sufficient to stop the process, if the infectious or toxic agent had already gone beyond the point of section. Tinel was baffled by the exact nature of the condition and felt that no form of treatment was satisfactory.

According to Wilfred Harris (Neuritis and Neuralgia, Humphrey Milford, Oxford University Press, 1926), a similar condition is occasionally found in diphtheria when, for instance, the navel of a new-born infant has become infected. Neuritis develops in the neighboring nerves and it seems probable that the toxin travels along the perineural lymphatics, as demonstrated experimentally by Orr and Rows. Ascending neuritis, moreover, according to Harris, is seen also in leprosy. The condition is well recognized surgically and a good description will be found in Homans' textbook (A Textbook of Surgery, ed. 4, Springfield, Ill., and Baltimore, Charles C. Thomas, 1936), page 295. He too speaks of the severe nature of the condition and the difficulty of cure.

It would seem, therefore, that ascending or migratory neuritis, once considered fairly common, is really a rare disease. Cases, however, have been observed, particularly during the World War, which have led to the recognition of this condition in neurologic literature. Some of the current textbooks, however, do not mention ascending neuritis. Incidentally, the statement quoted from the tenth edition of Osler's Practice of Medicine has remained unchanged in the twelfth edition, 1935.

EFFECTS OF INADEQUATE TREATMENT OF  
PRIMARY SYPHILIS

*To the Editor*—My impression is that insufficient treatment for syphilis, for example six intravenous injections of an arsenical given during the primary stage, has a tendency to influence the disease to skip the secondary stage and pass on to the third stage or to the central nervous system. Is there a tendency likewise for the six injections to influence the disease not to involve the vascular system and jump to the central nervous system? In other words would you consider aortitis as an intermediary between the secondary stage and involvement of the central nervous system or is aortitis an end result of the third stage? Another way of expressing the question would be: Would a person who does not have any treatment have more chances of having aortitis and not having the central nervous system involvement than one who has only six injections? It is true is it not that a person with vascular syphilis rarely has syphilis of the central nervous system?

M D Mississippi

*ANSWER*—Six doses of arsphenamine given during the pre-lymphatic stage of syphilis, far from influencing the disease to skip to the secondary stage, would probably provoke a higher incidence of infectious mucocutaneous relapse of the secondary type than if no treatment had been given. There is no satisfactory evidence that the inadequate treatment of early syphilis, whether primary or secondary, increases the incidence of any type of central nervous system syphilis, except acute meningitis. Neurosyphilis, although such inadequate treatment may hasten by several years the appearance of clinical symptoms and signs of all forms of neurosyphilis. There is gradually accumulating evidence to indicate, however, that even the thoroughly inadequate arsenical treatment of early syphilis is of value in reducing the ultimate incidence of syphilitic aortitis. Thus the inadequate treatment of early syphilis may increase the incidence of infectious mucocutaneous relapse and of acute meningitis. Neurosyphilis, has no influence on the incidence of other forms of neurosyphilis except to hasten the time of appearance of clinical symptoms and signs, and may protect the patient against the ultimate development of cardiovascular syphilis.

Aortitis is not an intermediary between the second stage and involvement of the nervous system. From the pathologic standpoint invasion of the aorta probably occurs quite early in the course of the disease. From the clinical standpoint, however

the development of cardiovascular syphilis is an event of late syphilis with an average interval of approximately twenty years between infection and the appearance of clinical symptoms and signs

A person who does not have any treatment does run more chance of the development of aortitis than one who has had only six injections in the primary stage. The absence of early treatment, however, does not render him less liable to the development of central nervous system involvement than inadequate early treatment

It is distinctly not true that a person with vascular syphilis rarely has neurosyphilis. On the contrary, the two conditions are associated with a high degree of frequency

#### REACTION TO DIGITALIS

*To the Editor*—A woman aged 50 has cardiovascular syphilis and exhibits signs of aortic regurgitation and aortic stenosis enlargement of the heart, and syphilitic aortitis with a beginning fusiform aneurysm. Also she has eczema of the external auditory canals. Her blood pressure varies from 210/80 to 130/80 most of the time being around 170/80. Since February 1937 I have given her 2 cc of iodobismutol each week. In May the patient began to have edema of the ankles and feet and of the abdominal wall. Her pulse was 100 and regular. I gave her 1½ grains (0.1 Gm) of digitalis three times a day. Six days later she had nausea and vomiting. Her pulse was 48 at the precordium at the vessels of the neck and at the wrist. It was slightly irregular. I took her off digitalis and she made a rapid recovery. Eight days later I resumed the digitalis with a dosage of 1½ grains daily. Twelve days later she again had nausea and vomiting. The pulse rate was 70 and regular. I stopped the digitalis and after she recovered thinking that I was dealing with gastric irritation I had some rectal suppositories of digitalis 3 grains (0.2 Gm) made up and gave her one twice a day for three days and then one daily. Nine days later the patient was again vomiting. The pulse was 70 and regular. Thinking that possibly the patient had a digitalis fixation I let her think I was giving her some nerve pills but actually gave her 1½ grains of digifoline three times a day. Two days later the patient developed urticaria and on the following day began to vomit again. I am aware that digitalis is not well tolerated in cases of aortic regurgitation but I am not aware of the reason. Is it possible that the patient could be allergic to digitalis? May not the urticaria have been a sign of this? Would 1 cc of digalen or digifoline or one of the other injectible digitalis preparations given intradermally serve as a skin test? And could the patient be desensitized if allergy exists by increasing doses of the same preparation?

M D Iowa

*ANSWER*—The symptoms described do not suggest an allergic sensitization to digitalis. They are definitely the symptoms of the pharmacologic effects of digitalis. The urticaria in this case, occurring as it did after many days of the administration of digitalis, is not at all a likely indication of an allergic reaction. It is much more likely a coincidental occurrence.

This patient apparently responds normally to digitalis but requires much smaller doses to produce slowing of the heart. It is necessary in such a case to administer smaller doses, to watch carefully for the first signs of nausea or pulse irregularity, and to reduce the dose as soon as these signs become manifest. With the occurrence of the toxic symptoms described it may be necessary to wait not nine days but a full three weeks before resuming digitalis therapy at a reduced dosage.

#### ELECTROLYSIS—REMOVAL OF HAIR

*To the Editor*—What is the difference in chemical reaction when the needle is inserted in a hair follicle to remove superfluous hair first if the positive pole is used and secondly if the negative pole is employed? A black dot is left if the positive pole is employed; this occurs immediately after the electricity has been turned on. Is there any treatment to remove this black dot? What is to be done if the spot does not disappear?

M D New York

*ANSWER*—The principle of electrolysis can be demonstrated by plunging two platinum wires, connected with the positive and negative poles of a galvanic current, into acidulated water. These should be kept a small distance apart. On closing the circuit the water is decomposed into its component gases, the electropositive element hydrogen, is liberated at the negative pole the electronegative element, oxygen is found at the positive pole.

When the positive pole is used the reaction of the tissue, as the result of the liberated oxygen is acid.

When the negative pole is inserted into living tissue the reaction of the tissue is alkaline owing to the liberation of hydrogen. Albumin is coagulated.

For this work very fine iridioplatinum or unoxidizable steel needles should be used for positive pole work. For negative pole work platinum or plain steel needles may be used.

The black dot is due to formation of a perchloride of iron when plain steel needles are used with the positive poles. This is a form of tattooing and should be treated on the same principles.

#### SPONTANEOUS PNEUMOTHORAX

*To the Editor*—A youth aged 18 years an experienced French horn player suffered a complete spontaneous collapse of the right lung ten weeks ago while playing his instrument. Previously in the spring while in the orchestra he felt momentary pain in the right side of the thorax and transient dyspnea. No physician saw him at these times. Following the collapse there was slight fever for two or three days and considerable dyspnea with displacement of the mediastinal contents. The air was absorbed in three or four weeks a small amount of fluid formed and on absorption of the fluid there was some pleural pain for a few days. The Mantoux test (0.1 cc of 1:1000 old tuberculin known to produce positive reactions) was negative and stereoroentgenograms after expansion showed no abnormalities. He is in excellent health now. Would it be advisable for the boy to return to horn blowing and if so how soon? He is more or less dependent on his music to obtain a college scholarship and is anxious to continue playing if there is no great additional risk.

M D North Carolina

*ANSWER*—In recent years, through modern methods of diagnosis and periodic examinations of healthy persons, spontaneous pneumothorax has been removed from the list of rare conditions. While it is true that many pathologic processes, such as tuberculosis, malignant growths, pneumonia and abscess, may cause spontaneous collapse, the fact is now well established that many persons have this condition in whom the most complete examination fails to reveal any evidence of disease in the lung during life.

The condition described was designated "pneumothorax simplex" by Kjaergaard (*Acta med Scandinav* 43 17), who called attention to the fact that it occurs in healthy persons and frequently has no relationship to tuberculosis. Prior to his work, spontaneous pneumothorax was regarded as *prima facie* evidence of tuberculosis and not less than one year of strict bed rest preferably in a sanatorium was recommended. Further investigation, however, has revealed the fact that even the tuberculin test is negative in many young adults with spontaneous pneumothorax. In fact, in some groups of cases with undetermined etiology, such as those reported by Leggett, Myers and Levine (*Am Rev Tuberc* 29 348 [March] 1934), more than 50 per cent were negative to the tuberculin test. Pneumothorax simplex appears with much greater frequency among young males than among females of the same age, but no satisfactory explanation has been offered for this difference in the sexes. The French have referred to it as "pneumothorax des conscrits," as they have seen it most frequently in men of military age, from 20 to 40. It is thought that pleural blebs or congenital cysts may be responsible for many such cases. As pathologic areas in the lung or pleura must be macroscopic and favorably located to be brought to light by x-ray examination, it is impossible to determine the location of the rupture in the visceral pleura during life. The use of the thoracoscope may be helpful, but even this method does not always locate the area.

The symptoms of pneumothorax simplex usually consist of excruciating pain in the chest, which may persist for a few minutes and gradually subside. Often this is accompanied and followed by a period of dyspnea, which in most cases is severe for a short time and within a few hours has almost completely disappeared. The condition may develop during some exertion, such as lifting or carrying a heavy load, violent laughter, coitus, and straining at stool, again, it may occur when the patient is sitting quietly in a chair and it has even been reported to occur during sound sleep. In most cases of pneumothorax simplex, apparently the rupture in the visceral pleura soon closes and the air in the pleural cavity slowly absorbs so that within a few weeks the lung completely reexpands. It is not uncommon to see a small amount of serous fluid accumulate in the pleural cavity. Usually no treatment is indicated if a diagnosis of pneumothorax simplex is definitely established. Until such a diagnosis is established however, it is well to have the patient on strict bed rest while the lung is observed to be reexpanding in the usual manner.

Spontaneous pneumothorax may appear on the two sides simultaneously, again, the condition may exist on one side and at some subsequent time appear on the opposite side. Recurrent spontaneous pneumothorax has been reported by a number of physicians, but apparently many persons who have pneumothorax simplex never have recurrences regardless of occupation or activities at any rate they do not report to physicians.

The examination of this patient was adequate to rule out tuberculosis and probably has eliminated other serious lung disease. It is impossible to determine whether there will be one or more recurrences regardless of whether he plays a wind instrument as spontaneous collapse might recur even while he is sleeping. Again there may never be a recurrence even though he continues as a musician or indulges in violent exercise. However, as there is the remote possibility of complications, such as empyema in case of recurrence, it would seem safer to have him avoid strenuous exertion.



## LICE

*To the Editor*—Is it possible to have recurrent attacks of infestation with *Pediculus pubis* over a period of five years—say every year and a half or so? Is there a spore or some part of its life cycle that can burrow deeply and come to the surface at the time? I have a patient who has had three attacks within the last eight years the last attacks about two years or less apart. He is meticulous about his linen and bathing habits. He is firm in his denial of sexual intercourse outside his home. In cases of intercourse with an infected partner after how long a time will the infection be noticed by the free partner? In other words if he had outside intercourse say three months ago could he be just noticing the infestation? Each infestation (which has been light from three to six lice actually found) has been treated with thorough shaving and mild mercurial ointment.

M W NEW M.D., Seoul, Korea

**ANSWER**—Lice do not sporulate but lay eggs, called nits, which appear as pear shaped white bodies tightly adherent to the hair. They hatch in from four to seven days and cannot lie dormant. A new attack of pediculosis can be acquired only by another infestation. Sexual contact is not necessary. Lice can be acquired from infected clothing or bed linen.

The time elapsing between infestation with the crab louse and their coming to the attention of the host depends on his power of observation. The fact that the crab louse does little traveling and hangs with its head in the follicular opening makes it much less easily seen than other lice, but the itching is usually intense and should prevent the host from remaining ignorant for very long of the presence of his guests. It is possible that there are persons who do not experience much itching, but that a man of cleanly habits could harbor these parasites for months without being conscious of their presence is highly improbable.

It is a well established fact that certain persons are very attractive to lice, so that they readily leave another host. It may be that the patient mentioned is one of these.

A solution of mercury bichloride in water, 1:500 or even 1:250, is just as efficient as the mild mercurial ointment and much less messy. Shaving should be thorough, so that no nits escape. The hair on the abdomen, thighs, lower part of the back, chest, axillae and even the eyelashes and the hair at the border of the scalp should be inspected for nits.

## ULNAR NEURITIS FROM INFECTION

*To the Editor*—I have recently treated two patients who gave similar histories. One had a splinter in the web between the middle and ring fingers. This was followed by infection of moderate degree, without an associated lymphangitis lymphadenitis or fever. Neither the hand nor the forearm was immobilized other than for the dressing of the fingers. About ten days later a beginning atrophy of the first interosseous muscle was noted which has progressed for a period of a year so that there is practically no muscle tissue remaining. The second patient also had a splinter in the web between the ring and little fingers. This hand has been immobilized for a month. The atrophy he is showing is more generalized involving all interossei. The first patient was examined by a neurologist who felt that he had developed an involvement of the ulnar nerve. What may the connection between the injury and subsequent infection be? If there is an ulnar paralysis what part of this nerve was involved in such a way that other features of ulnar palsy are absent?

M D, New York.

**ANSWER**—The symptoms described can be accounted for by ulnar neuritis resulting from the infection. The deep branch of the ulnar nerve, which controls the motor trophic function of the interosseous muscles, crosses the palm from the ulnar to the radial side to end in the first dorsal interosseus, the adductors of the thumb and the medial head of the short flexor of the thumb. The difference in involvement in the first and second cases can be explained by the fact that in the first case the involvement was closer to the termination of the nerve and a shorter segment of the nerve was involved. In the second case the involvement was more proximal and the fibers of innervation to all the interossei were affected. It is probable that the sensory fibers of the ulnar nerve, which separate from the nerve trunk close to the level of the pisiform bone, escaped injury and therefore the typical area of anesthesia associated with injury of the ulnar nerve above the wrist is lacking.

## PAIN TO CHILD DURING DELIVERY

*To the Editor*—Does the child that is being born suffer pain at any time during its expulsion from the interior of the uterus? Can you refer me to any researches on this point?

M D Missouri

**ANSWER**—This question has been considered to some extent and references can be made to the articles by Peterson and Ramey (*Bull. New York Living in Hosp.* December 1910), Pratt, Kraushaar and Sun (*Behavior of New-Born Infant* Ohio State University Press, Columbus 1930) and Canestrini (*Sinnesleben des Neugeborenen*, Berlin, Julius Springer, 1913).

It is known that a baby will draw its hand away when one tries to touch it in utero and will wriggle his head away from pressure during a vaginal examination. He changes his position frequently, evidently for comfort.

During actual delivery the baby probably suffers pain, because as soon as he gets out he cries vigorously and if pinched will cry some more.

Babies live in the uterus and during labor in a state of suboxidation or partial anoxemia, which probably makes them torpid. It is more than possible that the first vigorous cry is the result of the pain of labor. F F Snyder has shown that in rabbits respiration with circulation of liquor amni in the lungs continues throughout the latter part of pregnancy and there is reason to believe that the human fetus has respiratory action during pregnancy. If this turns out to be the rule there will be no necessity for the various theories regarding the cause of the first respiration, the baby simply continues as it was in utero. Perhaps the first cry may be explained by the pain which the baby suffers during delivery.

## SNAKE VENOM

*To the Editor*—A patient has the unique hobby of studying and handling snakes. Among those with which he deals are water moccasins, copperheads, rattlesnakes and corals. In addition, he is planning on adding to his collection by an early visit to the Everglades. Naturally he is cognizant of the danger to which he is exposed and as a result would like to know the feasibility of active immunization. Is this possible? If so how efficient is this procedure? Is there any appreciable danger? How permanent is the immunity (if any)? Is there sufficient similarity in the toxins to give rise to multiple immunity from the antigen?

M D New York

**ANSWER**—It is probable that immunization against the common poisonous snakes is not practical. After one month of injections a venom used in this manner contained anaerobic and aerobic organisms. Later both tetanus and gas gangrene organisms were found in similar venom. Dr Githens at the Mulford Biological Laboratory reports extensive liver and kidney damage in horses used in the manufacture of antivenin. In preparing antivenin, multiple antigens are used.

A snake collector is advised to wear boots, use great care, equip himself with a suction first aid kit and study the directions carefully before entering the field. If antivenin is carried, not less than five syringes are advised.

## SUCCESSFULNESS OF SKIN GRAFTS

*To the Editor*—I shall appreciate statistics regarding percentage of takes of various skin grafts employed in treatment of third degree burns of the leg.

M D, Illinois

**ANSWER**—Accurate statistics on the percentages of takes of the various types of skin grafts used in the treatment of third degree burns of the leg are difficult to state for the reason that the condition of the wound, the skill of the surgeon, and judgment as to type of grafts and of dressings used varies so much.

In the hands of an experienced surgeon with the granulations in perfect condition, small deep grafts on the leg will take practically 100 per cent. Ollier-Thiersch grafts will take approximately from 80 to 90 per cent. Whole thickness grafts in these cases are ordinarily contraindicated.

## GIARDIA LAMBLIA AND CHILOMASTIX MESNILI

*To the Editor*—Can you give me information on the treatment for elimination of *Giardia lamblia* and also of *Chilomastix mesnili*? While I realize that these organisms are non pathogenic I have lately had more than one case of chronic recurring diarrhea. Repeated stool examinations have shown decidedly more than usual presence of *Giardia*. I have also one case in which *Chilomastix mesnili* is in abundance with similar symptoms. The patient I have in mind at present is a child about 10 years of age. I have tried carbarsone in the hope that it might have some effect in eliminating the symptoms without any results. I would greatly appreciate any information you may be able to give me.

W R HERBERT M.D., San Diego, Calif

**ANSWER**—*Giardia lamblia* inhabits the duodenum and upper jejunum and has been found in the gallbladder. It is therefore not easily accessible to any form of chemotherapy. Sometimes treatment with amebicidal drugs such as carbarsone and chiniofon have been followed by its elimination, but the treatment is uncertain. *Chilomastix mesnili* inhabits the cecum and colon and sometimes the lower part of the ileum. Elimination of sugar from the diet and the restriction of other carbohydrates will sometimes cause elimination of the infection or the cessation of symptoms. Carbarsone has proved effective in some cases. The presence of these parasites is so common in the absence of clinical symptoms that some other cause for the symptoms should always be sought.



## TRAUMA AND LANDRY'S PARALYSIS

*To the Editor*—Please discuss the etiology of acute ascending paralysis (Landry's). A man aged 22 had a minor laceration of the head from a fall in a coal mine. Three or four weeks later he complained of mental symptoms. In the hospital roentgenograms were taken of the skull and the entire vertebral column but showed nothing abnormal. This case will come before the referee simply because of the head injury. Please advise me whether it is remotely possible that a minor laceration of the scalp could be the cause for this paralysis. I should like to have something definite so that should I be asked the question about the blow or laceration being the cause I shall be able to answer correctly.

M D Pennsylvania

**ANSWER**—There is no actual evidence that trauma plays any part in Landry's paralysis. Although the disease cannot be considered as a definite entity, the syndrome has many causes and some cases closely resemble acute polyneuritis while others suggest poliomyelitis. Occasionally rabies takes the form of acute ascending paralysis and, more rarely, multiple sclerosis. Trauma of the scalp, as described, cannot in any way be associated with this disease.

## BETTS AND SNELLEN CHARTS IN REFRACTION

*To the Editor*—I have advised against the adoption of the Betts test in the public schools in my neighborhood. What is the opinion regarding the usefulness and accuracy of this test? It seems to me that a child whose eyes need attention will show defective vision by the ordinary Snellen chart or symptoms in relation to the use of the eyes. Further analysis of these symptoms is the function of the eye physician. The agent who called on me showed me an article in *THE JOURNAL* of Jan 11 1936 page 147 in which the general tone of the remarks was favorable.

WENDELL L. HUGHES M D Hempstead L I N Y

**ANSWER**—The Betts charts are not considered by most ophthalmologists as superior to the Snellen chart. The latter remains the standard in testing vision and is probably more accurate than any other test. The diagnosis of refractive errors by the Betts charts is exceedingly unreliable and in the hands of nonmedical examiners is likely to lead to error and misunderstanding. The presence of binocular vision can be determined by the charts, but this is of doubtful value unless correlated with other observations of the eye physician who has other means as good for determining this function.

## EFFECT OF ALCOHOL ON TOXICITY OF PROCAINE

*To the Editor*—Kindly advise as to the possibilities of increased toxicity of procaine hydrochloride by admixture with ethyl alcohol in small amounts.

M D Indiana

**ANSWER**—Ethyl alcohol, even in a small amount is likely to increase the toxicity of procaine hydrochloride. It will do this by increasing its penetration into tissues as well as absorption into the blood.

## GASTRIC PHOTOGRAPHY

*To the Editor*—In *THE JOURNAL* Dec 11 1937 page 2008 appears an inquiry regarding the use of the gastrophotor camera for the photographing of the interior of the stomach. During eight years I have taken intragastric photographs in more than 300 cases. My latest paper on the subject which covered 216 cases studied at the Beth El Hospital was published in the *American Journal of Digestive Diseases and Nutrition* (3: 155 [May] 1936 abstr. *THE JOURNAL* July 25 1936 p 309). Roentgenology is the most valuable single method in use for the diagnosis of gastro-intestinal lesions. There are some gastric conditions however in which the roentgenogram fails to show the presence of any lesion or only a suggestive sign of a lesion. Such is the case usually when the lesion is located on the posterior wall of the stomach or when the ulceration is shallow and superficial. In such cases gastrophotography is of value. The gastroscope is being used at present also for the diagnosis of gastric lesions. However special training is necessary and it is a time consuming procedure objectionable to many patients. The use of the gastrophotor with the improved camera is a simple procedure taking only about thirty seconds to photograph a stomach. Its introduction is not more difficult than introducing a stomach tube for an ordinary Ewald test meal. In addition intragastric photographs have advantages that are common to roentgenologic films: metabolic charts and other graphic presentations; namely they are picture records in permanent form to be examined and studied at the leisure of the physician and can be compared with subsequent examinations. The three specific adverse points made in your reply can easily be refuted by any one who has studied the published reports and the Scientific Exhibits at the 1935 and 1937 sessions of the American Medical Association. 1. It is the opinion of many physicians who have worked with the gastrophotor that the pictures are clear and may be readily interpreted after some experience. These pictures are actual photographs and therefore show the gross pathologic changes present in the stomach. 2. By proper technique a correct orientation of the stomach is obtained. 3. Important changes in the mucosa are reproduced even on the black and white film. The last mentioned fact can be demonstrated by any one who will take the trouble to study the films and compare the pictures with the actual conditions found in the specimens obtained after surgical resection or postmortem examinations.

REUBEN FINKELSTEIN M D Brooklyn

## Medical Examinations and Licensure

## COMING EXAMINATIONS

## STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in *THE JOURNAL* March 5 page 761.

## NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Parts I and II* Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination May 9-11 (limited to a few centers) June 20-22 and Sept 12-14. Ex Sec Mr Everett S Elwood 225 S 15th St Philadelphia.

## SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Written examination for Group B applicants* will be held in various cities throughout the country April 16. *Oral examinations for Group A and B applicants* will be held at San Francisco June 13-14. Sec Dr C Guy Lane 416 Marlboro St Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *General oral clinical and pathological examinations for all candidates (Groups A and B)* will be conducted in San Francisco June 13-14. *Application for admission to Group A examinations must be on file before April 1*. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13. Washington D C Oct. 8. Oklahoma City, Nov. 15. *All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination*. Sec Dr John Green 3720 Washington Blvd St Louis Mo.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY Chicago June 10-11. Sec Dr Fremont A Chandler 6 N Michigan Ave Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10-11. Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha.

AMERICAN BOARD OF PEDIATRICS New York City May 3-4 and San Francisco June 12. Sec Dr C A Aldrich 723 Elm St Winnetka Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY San Francisco June 11. Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C.

AMERICAN BOARD OF RADIOLOGY San Francisco June 10-12. Sec Dr Byrl R Kirklin 102 110 Second Ave SW Rochester Minn.

AMERICAN BOARD OF UROLOGY San Francisco June 11-13. *All condensed case reports must be filed by April 1*. *Written examination will be held in various cities in the United States and Canada*. April 2. Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis.

## Arkansas December Examination

Dr L J Kosminsky, secretary, State Medical Board of the Arkansas Medical Society, reports the written examination held at Little Rock, Dec 21-22, 1937. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
University of Arkansas School of Medicine	(1937)	85	1
Tulane University of Louisiana School of Medicine	(1931)	85	4
		87	6

Eleven physicians were licensed by reciprocity and two physicians were licensed by endorsement from July 29 through December 23. The following schools were represented:

School	LICENSED BY RECIPROCI- TY	Year Grad	Reciprocity with
University of Illinois College of Medicine	(1936)		Illinois
University of Kansas School of Medicine	(1934)		Kansas
Louisiana State University Medical Center	(1937)		Louisiana
University of Michigan Medical School	(1929)		Penna
Memph Hospital Medical College	(1908)		Tennessee
Univ of Tennessee College of Med	(1920) (1930)	(1934)	Tennessee
(1936) Louisiana			
Vanderbilt Univ School of Medicine	(1916) Texas	(1934)	Tennessee

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Johns Hopkins University School of Medicine	(1935)	N B M Ex	
Temple University School of Medicine	(1934)	N B M Ex	

## Connecticut (Homeopathic) November Examination

Dr Joseph H Evans, secretary, Connecticut Homeopathic Medical Examining Board, reports the written examination held at Derby Nov. 9-10, 1937. The examination covered 7 subjects and included 70 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. The following school was represented:

School	PASSED	Year Grad	Per Cent
Hahnemann Med College and Hospital of Philadelphia	(1937)	82	4
		82	5

License has not been issued

## Book Notices

**Clinical Parasitology** By Charles Franklin Craig M.D. M.A. F.A.C.S. Professor of Tropical Medicine in the Tulane University of Louisiana New Orleans and Ernest Carroll Faust M.A. Ph.D. Professor of Parasitology in the Department of Tropical Medicine Tulane University of Louisiana New Orleans. Cloth Price \$8.50 Pp 733 with 243 Illustrations Philadelphia Lea & Febiger 1937

This book, by two of America's greatest experts in parasitology, belongs in the library of every practicing physician. To a considerable extent the rapid growth of bacteriology and its applications to medicine have overshadowed its sister science parasitology, with the result that the latter has not received the attention it fully deserves, particularly in temperate climes. In the face of repeated warnings in the medical literature over a period of years indicating that amebiasis, for instance, occurs throughout the United States with an average incidence of 10 per cent, realization of the importance of this disease in clinical medicine is only beginning to be appreciated. Knowledge of the methods of detection of *Endamoeba histolytica* and of its differentiation from harmless protozoa is not yet part of the equipment of the average clinician or even of many pathologists. Methods of preventing the disease are not widely known, the role of polluted urban water supplies in the transmission of the disease has been largely ignored. As the authors point out:

"it should be remembered that [polluted] water can be rendered safe only by boiling or filtration, as chlorine or other chemicals used in water purification are useless, owing to the resistance of the cysts of *E. histolytica* to these agents." In addition, adequate methods of treatment, though several are available, are often poorly understood. The remarkable progress that has been made in the elimination of hookworm infestation in the southern part of the United States is an excellent example of the cooperation of clinical and preventive medicine in the conquest of a parasitic disease. Proper utilization of the information in this book should go far toward the elimination of other infestations, among which amebiasis is one of the most widespread and most important. Among the subjects considered in the text are pathogenic and nonpathogenic amebas, intestinal, blood and tissue flagellates, coccidia, malarial plasmodia, ciliates, trichinella, trichocephalus, strongyloides, hookworms, ascaris, filaria, flukes, tapeworms, crustacea, millipedes, centipedes, spiders, ticks, lice, flies, blood-sucking flies, mosquitoes, fleas, bees, wasps and hornets. Especially valuable is a detailed technical appendix which includes methods of collection, preparation and identification of various parasites. The authors have incorporated an extensive and well chosen bibliography. Professors Craig and Faust are to be congratulated on the preparation of a comprehensive, unusually well organized, scientific and practical treatise. The book is excellently printed and profusely illustrated with drawings and photomicrographs.

**Le cancer ulcéreux de l'estomac (étude clinique radiologique)** Par le Docteur Th. J. Péristian. Papier Pp 113 with 44 Illustrations Paris Librairie E. Le François 1937

This small volume represents a thesis in monograph form, embracing a clinical and radiologic study of an important and controversial topic. The investigation was carried out under the encouragement and guidance of Professor Gosset, chairman of the thesis committee, and by Drs. Gutmann, Ledoux-Lebard, Garcia-Calderon and other members of the Faculté de médecine de Paris. The term "cancer ulcéreux" is applied to that type of primary gastric cancer which has the anatomic, radiologic and symptomatic characteristics in whole or large part of chronic benign gastric ulcer. The author properly distinguishes clinically between cancer ulcéreux, ulcère transformé and cancer ulcéré.

The author is in almost entire agreement with the point of view of many other investigators who maintain that gastric cancer in its circumscribed ulcerating, non neoplastic form may masquerade readily as benign ulcer and that differentiation may be impossible short of performing histologic examination of the resected specimen. The danger of relying on impressions derived from macroscopic examination of a specimen at the time of operation as the basis for advising a conservative surgical procedure is emphasized. However, disappearance of the

niche following treatment for ulcer and disappearance of the clinical signs are extremely reassuring. Of the laboratory methods available, search for occult hemorrhage at varying intervals of time appears to be the most reliable. The author also feels that the most important factor in making the diagnosis of ulceriform cancer is the roentgenologic examination. Of the niches which, when observed, arouse suspicion of the presence of carcinoma, the niche termed "en plateau," the triangular niche and the niche termed "encastrée" are the most characteristic. The meniscus sign, l'image en pessaire, stressed by German and American authorities, is described last. In the judgment of the author the large size of the niche, the irregularity of its contour and the discontinuation of the folds are important signs but are not pathognomonic.

Contrary to the opinion of some writers at home and abroad, the absence of tenderness on palpation of the niche has no differential diagnostic value according to the author. Situation of the niche on the greater curvature of the stomach or on the walls of the stomach does not signify the presence of cancer necessarily. He has observed that, whereas ulcer niches have a marked tendency to become smaller and to disappear following ulcer therapy, carcinomatous niches persist and increase in size. This increase in the size of the niche, even when accompanied by disappearance of symptoms, justifies performance of radical resection.

Although the bibliography consists largely of reference to French literature, the more important American, English and German contributions are included.

**Developmental Abnormalities of the Eye** By Ida Mann D.Sc. M.B. B.S. Surgeon Royal London Ophthalmic (Moorfields) Hospital. With a foreword by Sir John Herbert Parsons C.B.E. D.Sc. LL.D. Published for the British Journal of Ophthalmology. Cloth Price \$15 Pp 444 with 294 Illustrations New York Macmillan Company Cambridge University Press 1937

Any attempt to deal intelligently with developmental abnormalities of the eye must fall of its own weight unless supported by comprehensive knowledge of the embryology of the human eye and of animal eyes, as well as by a wide clinical experience from which a great deal of information concerning pathologic conditions of the eye has been gathered at first hand. The author of this book is peculiarly fitted by her extensive studies in embryology and comparative anatomy, and by a wide clinical experience, to correlate abnormalities of the eye that may seem to be pathologic, in the sense that they are the sequelae of disease, with the development of that organ under influences that are normal or abnormal. The method of approach to the subject that is of importance to a clinician is a logical exposition of the sequence of events during the stages of early development of the eye with the injection of hypothetical cases of abnormalities that may be expected if certain things happen at certain stages of embryonic growth.

The first chapters are devoted to a discussion of the mechanism of the production of developmental abnormalities as revealed by study of teratology and fetal pathology. Sufficient reference to experimental work bearing on the subject is included in the text to remind the reader of forgotten hours spent in poring over dry anatomic treatises and to revive an interest in the academic foundation of his clinical practice which may now seem so remote and so obscure. The problem of genetics, "possibly the most important of all, in their relation to anomalies," is illustrated on the basis of experimental investigation on the fruit fly of which all ophthalmologists have some knowledge. "After birth, diseases and environmental changes are no longer classified among the causes of developmental anomalies, and such anomalies as arise during the early years are germinal or mutational in origin. Examples of such conditions are medullation of the retinal nerve fibers and heterochromia.

There are 418 pages of clearly written text, amply illustrated by schematic drawings, photomicrographs and many colored plates. The chapters on abnormalities of the fundus oculi explain ophthalmoscopic appearances of the disk, choroid and retina that may represent variations, deviations or arrests in embryologic development and the stage of development at which the incident probably occurred. Familial and hereditary degeneration, such as retinitis pigmentosa, the Lawrence Moon Bredl syndrome, dystrophies, vascular anomalies and von Hippel

Lindau's disease, are considered from the standpoint of the influences that brought them about and why the abnormal development continues after birth. Most interesting are the sections devoted to abnormalities of the iris, lens and cornea. Distinction between developmental and acquired anomalies of these structures is not always easy, but many of the difficulties are explained by natural processes which the author points out.

For the student of anatomy the book brings to attention the observations of clinical practice that are so essential to understanding the significance of abnormal conditions of growth and development, either in natural or in experimental environment, and to the practitioner of ophthalmology it makes available the results of years of careful clinical observations by distinguished physicians and the patient researches of students working in the laboratories of the fundamental sciences.

*Die Störungen der Sexualfunktion bei Mann und Weib* von Dr. Ludwig Chlaviere. Mit einem Geleitwort von Prof. Dr. Otto Potzl. Paper. Price 4.00 marks. Pp. 147. Leipzig & Vienna: Franz Deuticke, 1938.

The title of this small monograph, which presupposes a discussion of the disorders of the sexual function, is really misleading. The main portion of the work is taken up with impotence and only about fifteen pages is reserved for sterility. The subjects of masturbation, pollution, priapism, satyriasis, nymphomania, vaginismus and similar definite disorders of the sexual function in both sexes are not considered at all. There are, however, some sensible views uttered in the text. The author states correctly that impotence and frigidity are not diagnoses but symptom complexes and that for this reason the treatment varies with the individual cause. This is a sensible and necessary conception, because of late many drugs and operations have been recommended for impotence without any attempt at differentiating with regard to the basic pathologic condition.

The author warns against considering every form of impotence as imagination on the part of the patient and against neglecting to consider organic conditions in relation to impotence or to consider everything about impotence as psychic. In such a small monograph, too much space is wasted on the consideration of all the possible causes of impotence, many of which are factors only in rare cases. The author bemoans the fact that our civilization has a tendency to thwart natural potency and so make for impotence, since both the male and the female cannot indulge in coitus just when they most desire it but must restrain themselves on account of decency and other considerations till they find a proper time and place. This restraint, according to the author, works against natural coitus. However, he ignores the fact that after centuries of civilization the normal adult of both sexes has become accustomed to such restraint without any hardship and is therefore different from the brute animal. Were it otherwise, all men would be sufferers from satyriasis and become rapists.

Although pathologic conditions in the posterior urethra are mentioned as a possible cause of rapid and premature ejaculation, the author seems to doubt their relationship. He wisely decries the tendency to recommend certain articles of diet which the general public and some physicians believe are advantageous for potency. It is positively harmful to recommend, as the author does in those cases in which the impotence in the husband is supposed to be due to a sexual inadequacy or frigidity on the part of the wife or partner, a change of the sexual partner. Of course he says that this advice should be given only on the rarest occasions but one can easily see to what latitude such advice can be stretched by one who only awaits an excuse for infidelity. He advises that the physician should not directly recommend this procedure but should explain the situation plainly to the husband on the ground that the latter will generally understand and take the hint. Such an underhand method of procedure is beneath the dignity of the medical profession, to say the least.

The author has some sensible views as to the uselessness of various forms of baths, diathermy and similar modalities in the therapy of most forms of impotence. His treatment of impotence is largely a naming of the various patented endocrine preparations and he especially prefers the pluriglandular preparations the very ones which endocrinologists in America decry as essentially unscientific. Hardly any mention is made of

prostatic treatment and the treatment of the prostatic urethra with silver nitrate instillations, except the occasional mention of a cold sound.

His discussion of sterility in both sexes might serve a student who is preparing himself for an examination on this subject, but it is really of little practical use either to the general practitioner or to the specialist. The entire subject is covered in fifteen pages and the diagnosis takes only about one and a half pages. The treatment is considered in about five pages and is virtually an enumeration of the various forms of treatment employed in this condition. Neither the Rubin nor the Huhner test is mentioned and these names do not appear in the author's bibliography.

*Medical Records in the Hospital* By Malcolm T. MacEachern, M.D., C.M., D.Sc., Associate Director, American College of Surgeons. Cloth. Price \$3. Pp. 374 with 134 illustrations. Chicago: Physicians Record Company, 1937.

From the experienced author of "Hospital Organization and Management" has come a new volume, equally authoritative and practical, covering every phase of the medical record work in hospitals. A veritable storehouse of information this book represents a compilation of earlier writings modified in the light of present day experiences and supplemented by data on the new developments in the record field. In logical order the material is presented in nine chapters dealing with the development of the medical record, record librarian, contents and forms, methods of securing the medical record, supplementary records in adjunct departments, preservation of the medical record, uses, clinical photography and the hospital medical library. Interpersed are approved forms for every part of the clinical and statistical records and other valuable illustrations and charts. Five of the chapters contain addenda presenting curriculums on the hospital and college training of record librarians, regulations governing the registration of record personnel, history outlines, sample case records, specialty forms, palm prints and footprints in the identification of the new-born, regulations concerning the legal use of records and transcripts, records of staff meetings and lists of textbooks, periodicals and publishers. There is an extensive bibliography, a list of illustrations and forms and an ample index of fourteen pages.

This comprehensive book, written in a masterly and systematic manner, is a complete answer to the record problems of today. It has introduced many new subjects of increasing importance to the record personnel and has helped greatly to elevate the status of the record department. There are timely discussions on the record difficulties in small hospitals, classification of major and minor operations, frequency of progress records and the need for condensed nurses' bedside notes in order to conserve time and paper and eliminate the bulk of irrelevant material which only creates a difficult filing problem.

This volume is particularly valuable to the record personnel as a textbook and guide but should prove equally useful to hospital administrators, staff physicians, the record committee, department heads, resident physicians, interns, nurses, social service workers and technical personnel participating in the care of patients.

*Occidental Therapeutics in the Netherlands East Indies During Three Centuries of Netherlands Settlement (1600-1900)* By Dr. D. Schoute. Cloth. Pp. 214 with 4 illustrations. Batavia: Netherlands Indies Public Health Service, 1937.

The purpose of this publication, says the author, "is to supply a concise summary, in a universal language, of the researches carried out by him with the consent of the Indian government on the development of the medical service in the Netherlands East Indies. In these years of widespread political tension, each colonizing country will have to ask itself how it has acquitted itself of its task and whether it has apart from obtaining advantages for itself, also brought welfare and real prosperity to the lands over which it holds sway. He quotes Field Marshal Lytton to the effect that the only excuse for colonization is medicine, and while the author does not go as far as this, preferring to include in that excuse other contributions to the happiness of the inhabitants of the colonies, a great and valuable part of it must be allotted to medical science. The body of this book makes almost as fascinating reading as do the stories of early exploration for it starts with the beginning of Netherlands colonization enterprise under the United

**Netherlands East India Company** It describes the kind of ships that the company sent out and their meager medical equipment. The care of the health of the employees of the company was entrusted to "surgeons," that is, members of the barbers' guild, whose examination consisted in the grinding of three crude pieces of iron into bleeding scalpels and the performing of some bleedings on test persons. He defends this condition by pointing out that the company would have been unable to supply the large number of academically trained physicians required and also that the knowledge of the physicians of those days would probably have been no more efficient against the murderous diseases that ravaged the ships and the colony because of the state of ignorance that existed. No wonder that nearly 8 per cent of all who started out on a voyage to the colony were reported lost. After the establishment of Batavia a hospital was founded and in the course of time hospitals were established elsewhere, but throughout the 200 years of the existence of the Netherlands East India Company the medical service was exclusively for the benefit of the employees of the company. Among the general population the mortality from endemic as well as epidemic diseases was very high. Military medical service that next continued the work of the East India Company extended itself also in the direction of general sanitation and this, together with the advances in medical science that occurred most especially during the last century, has greatly improved both the mortality and the morbidity conditions. Dr. Schoute's book must be accepted as an interesting and important contribution to the history of medicine in the colonies of European nations.

**An Introduction to Nematology** By B. G. Chitwood and M. B. Chitwood. Section I Part 1. Paper. Pp. 53 with 53 illustrations. Baltimore. Monumental Printing Company. 1937.

This is the first number of a projected treatise from the zoological point of view in the much neglected field of nematology. The nematode worms from an ecological and medical point of view are of great importance. They abound in the soil and in organic wastes of civilization, and in humus, sewage, sludges, and offal of organic origin. They infest important cultivated plants such as beets, parsnips, onions, potatoes, sugar cane, pineapples and wheat. They invade gardens, dwarf chrysanthemums and daffodils and make greenhouse soils unproductive. They occur as parasites in the bodies of most animals, and scores of different species parasitize the organs and tissues of man. Although they are relatively simple in structure, this very simplicity makes their classification and identification difficult and uncertain. What they lack in structural complexity they more than make up in diversity in life cycles and in facultative abilities in surviving in other hosts than those in which they normally occur. Furthermore, some of their ova at least have astounding powers of survival under adverse conditions of environment. The Chitwoods plan a work in ten numbers, with specialists as collaborators, in which an accurate and comprehensive account of this difficult group of organisms will be given. If the high standard of the first number is maintained in later ones, the completed work will be an invaluable aid to perplexed parasitologists as well as to physicians, veterinarians and investigators of soil science. The authors, as members of the staff of the United States Department of Agriculture, have library facilities, collections, connections and associates which, it is to be hoped, will make possible the early completion of this much needed work.

**Report of the Eighth Australian Cancer Conference Held at Canberra 13th-16th April 1937** Commonwealth of Australia. Paper. Pp. 66. Canberra. L. F. Johnston. 1937.

This is a report of the efforts of the Australian government and of the individual Australian states to educate the public in the importance of early diagnosis and also to train the physician in the methods of treating neoplasms, especially in the use of radium in which the commonwealth has staged an interesting experiment. Ten Gm. of radium has been purchased and radon is sent throughout the country to qualified physicians; the use of the element itself being restricted to a few large hospitals. Tables of deaths from malignant disease from 1908 to 1935 are given showing that the recorded death rate has nearly doubled in this period and in addition, analyses of the different types of neoplasms showing, for example that cancer of the

tongue is some twenty times more frequent in males than in females. There are also tables showing the extraordinary frequency of cancer of the skin in Australia, a fact which has been used to buttress the idea that sunlight is a causative agent in this type of cancer. Another section comprises short reports of investigations on the measurement of x-rays and radium, the biologic effects of radiation, possible developments of radiation therapy in the future, some general cancer research, and a convenient classification of tumors for use in reporting deaths from cancer. The pamphlet is interesting not so much for the facts which it contains as for the picture it gives of an attempt to develop by government initiative in a relatively homogeneous community with widely distributed population centers an efficient use of various types of radiation in the treatment of cancer.

**Let's Help the Doctor** By Margaret O. Donovan Rossa. R.N. Cloth. Price \$1.50. Pp. 141. New York. Devin-Adair Company. 1937.

This book may not be the worst of books on home nursing, but it is not even moderately good. It would have been better if the author had adhered to her announced intention, as expressed in the introduction, of describing simple home nursing procedures. Instead, she puts in a chapter on vitamins, which is not only out of place but entirely inadequate and shows several evidences of poor judgment with respect to what every mother ought to know about vitamins as, for example, "How can I recognize body symptoms which will tell me if my family is getting enough, too much or too little of each of the vitamins?" Such advice contributes to the prevalence of the great American disease vitamin-jitters, which has attained the magnitude of an epidemic. The introduction of poetry or, at any rate, verse, into the text is unusual in this type of writing and seems like a forced attempt to be sprightly, as do a number of other inappropriate interpolations. The chapter on the symptoms of diseases is not only out of place but is poorly prepared, conducive to home diagnosis of serious disease and potentially dangerous. The "simple care of pregnancy," including illegal operations (1), in six short pages, is altogether too simple. The facts of life, in four pages, are simpler still—including the menopause, menstruation and what a young girl ought to do when "alone with a young man." The chapter on first aid is full of slipshod and poorly selected information and bad advice. Much of the material appears to have been assimilated none too well from medical digests of the "compend" type to which medical students resort in the last hours before final examinations. The best recommendation is "Let's Help the Doctor" by not reading this book.

**Keeping Well** The Second Series of Radio Talks Broadcast Every Tuesday by the Baltimore City Health Department and the Medical and Chirurgical Faculty of Maryland. November 21, 1933. April 21, 1936. Paper. Pp. 284 with one illustration. Baltimore. Baltimore City Health Department Bureau of Health Information. [n. d.]

This collection of radio talks is of exceptional merit. In their original mimeographed form they have been received weekly by the American Medical Association Bureau of Health and Public Instruction, and through the courtesy of the Baltimore Health Department and the Medical and Chirurgical Faculty of Maryland many of them have been added to the Bureau's radio library and have been broadcast again by medical societies in many parts of the country. This appearance now in a paper-bound volume brings them together in handy form, constituting not only an interesting record of a valuable service in health education by radio but a convenient book of briefs, in language for the lay reader or listener, of almost 150 popular and timely health topics. Such a book should be in the libraries of health departments and county medical societies sponsoring speakers' bureaus and radio programs, as convenient and authentic quick reference material and suggestions for topics and for the successful handling of them.

**In the Lives of Men** By Alan Hart. Cloth. Price \$2.50. Pp. 451. New York. W. W. Norton & Company Inc. 1937.

This novel with a medical background is another of the contributions of Alan Hart. These medical novels are of interest but apparently not of sufficient appeal to attract a wide audience. Because of their locale (in the Northwest) they should appeal particularly to the physicians of that area.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts Removal of Hair by Electrolysis Not the Practice of Medicine**—In the opinion of the supreme court, appellate division, first department, New York, the removal of hair from the human face by an operator of a beauty parlor by electrolysis does not constitute the practice of medicine within the meaning of the medical practice act of New York. Superfluous hair neither constitutes a "disease," "deformity" nor "physical condition" within the meaning of the act. In reaching this conclusion the court quoted as follows from the dissenting opinion in *Engel v Gerstenfeld*, 168 N Y S 434 (reversed in 171 N Y S 1084)

Concededly there is nothing in the record to show that the growth of hair on a woman's face is a disease. The question then arises: Was it a 'deformity' within the meaning of the statute? The Century Dictionary describes a 'deformity' as a 'deformed or misshapen condition, an unnatural growth or a distorted or misshapen part or member disfigurement as a bodily deformity'. The statute does not state or contain a definition of any of these words. The presumption therefore is that they were used in their ordinary sense and with their ordinary intent. A growth of hair on a woman's face can certainly not be a deformed or misshapen condition. In considering the second meaning given viz., an unnatural growth or a distorted or misshapen part or member, the words 'unnatural growth' cannot but pertain to matters that are *eiusdem generis* when joined with the expression 'or a distorted or misshapen part or member' common sense dictating to us that in the ordinary acceptance of such terms reference must naturally be to a physical growth or deformity such as a web foot or a hunch back. Proceeding to the third meaning given by the Century Dictionary we find that the word 'disfigurement' is stated to be 'the state of being disfigured, i. e., physically marred in any manner'. It would clearly be absurd for us to say that 'physically marred' would be applicable to the case at bar.

Was this a physical condition within the meaning of the statute? A physical condition is I take it any condition that is perceptible by the senses. Therefore a physical condition is anything or any condition about the body which is the subject of observation. It could very forcibly be argued that the growth of a finger nail or premature baldness or a visible birthmark, or any growth upon the body is a physical condition but the legislature I am sure did not intend that such an interpretation should be put upon these words. It is quite as logical to say that a manicurist or a barber is guilty of practicing medicine without a license in removing parts of the finger nail or the hairs on a man's face as this plaintiff is in removing hair from a woman's face.

The present case was a test case and the court was convinced that the medical practice act was never intended to cover the type of beauty culture here involved. The judgment of conviction was therefore reversed—*People v Lehrman* (N Y), 296 N Y S 580.

**Malpractice Mistaken Diagnosis by Chiropractor, Testimony of Doctor of Medicine Admissible**—The plaintiff, while carrying a heavy timber, accidentally fell and injured his hip. The defendant, a chiropractor, attended him. Alleging that the defendant improperly diagnosed his condition and failed carefully and skilfully to treat him, the plaintiff sued the defendant. The trial court gave judgment for the plaintiff, and the defendant appealed to the Supreme Court of Utah.

The defendant, according to the complaint, informed the plaintiff that the pain he was suffering in his hip was rheumatism, for which he adjusted the plaintiff's spine over a period of approximately eight months. It subsequently developed that the plaintiff was suffering from osteomyelitis of the hip. Much suffering was alleged to have been endured because of the defendant's negligent treatment of the condition. On appeal, the defendant contended, among other things, that the trial court erred in permitting witnesses who were licensed to practice medicine and surgery to testify, urging that the only evidence that was admissible bearing on his malpractice was the testimony of chiropractors. With this contention the Supreme Court disagreed. In states, the court said where the different schools of healing are classified into allopathic, homeopathic, osteopathic, chiropractic or other schools there is ample authority to support the contention that the professional conduct and treatment of a practitioner of one particular school should

be tested by the rules of his school and not by those of other schools. In Utah, however, chiropractors obtain licenses under a provision of the medical practice act authorizing the issuance of licenses "to practice the treatment of human ailments without the use of drugs or medicine and without operative surgery in accordance with the tenets of the professional school, college or institution of which the applicant is a graduate as designated in his application for license." An applicant for such a license is required to take an examination of the same character as that required of an applicant for a license to practice medicine and surgery in all branches, excepting materia medica, therapeutics, surgery, obstetrics and theory and practice. Thus, the court pointed out, a person who has a license and holds himself out as a chiropractor holds himself out as qualified to treat human ailments with all the qualifications of one holding a license to practice medicine in all its branches, "excepting therefrom materia medica, therapeutics, surgery, obstetrics and theory and practice." The legislature intended that a license to practice medicine and surgery should cover the whole field of treatment of human ailments. Such a practitioner, therefore, possesses the qualifications to testify as an expert in a malpractice case charging malpractice in diagnosis or negligent treatment of human ailments. The trial court did not err in admitting the testimony of the doctors of medicine.

The fact that the treatment given by the defendant, said the court, did not effect a cure could not constitute the basis of a cause of action. Neither does the fact that a practitioner fails to diagnose or treat a patient in the same way as another practitioner constitute malpractice. Whether a person coming from a school of chiropractic training should be required to have a knowledge of the subjects required of a practitioner of medicine and surgery in all branches, except those subjects specified, is not for the court to determine. The law was passed, not for the purpose of imposing burdens on those desiring to qualify to treat human ailments, but to protect the public. The court may not concern itself with respect to the policy of a law, that is exclusively a legislative function.

The court finding no error in the proceedings of the trial court, the judgment in favor of the plaintiff was affirmed—*Walphenhorst v Kesler* (Utah), 67 P (2d) 654.

### Malpractice Statute of Limitations in Relation to Bill of Particulars Setting Forth New Cause of Action

—From July to December 1929 the plaintiff underwent a course of treatment from the defendant, a physician, for hemorrhoids, during which time a hemorrhoidectomy was performed. The following May the patient suffered from a severe proctitis with a spasm of the sphincter muscle. The defendant again attended him, relaxed the sphincter and under a general anesthetic, and instructed him to return several days later. On the latter date no treatment was administered because the patient "was suffering from a sore throat and not feeling well." The patient then consulted another physician. Eventually a streptococcal infection set in, resulting in a pelvic abscess. On May 11, 1932, the patient sued the defendant for damages for malpractice. The trial court gave judgment for the plaintiff, and the defendant appealed to the Supreme Court of Michigan.

The plaintiff's declaration alleged that on May 12, 1930, the defendant was employed to perform a hemorrhoidectomy on him and that owing to the negligent performance of that operation a streptococcal infection set in, resulting in a pelvic abscess. To this declaration the defendant filed an answer alleging that any treatment administered to the plaintiff by the defendant terminated on Dec. 7, 1929 and as to this course of treatment the two years statute of limitations was pleaded. When the case came to trial, in April 1934, the plaintiff was permitted to file a bill of particulars specifying the negligent acts relied on, which stated that the negligence, unskillfulness and malpractice of the defendant consisted in not properly diagnosing the patient's condition on May 12, 1930 and in relaxing the sphincter muscle in the presence of the existing proctitis. To this bill of particulars the defendant objected, claiming that it set out a cause of action not stated in the declaration and that the cause of action thus set out was also barred by the statute of limitations. The undisputed testimony, the court said, was that the hemorrhoidectomy was performed prior to December 1929, and since the declaration alleged negligence in connection with

that operation the action was barred by the statute of limitations. The bill of particulars filed in April 1934, continued the court, alleged malpractice in connection with the relaxing of the sphincter muscle, May 12, 1930. It abandoned the claim of malpractice in connection with the hemorrhoidectomy and thus alleged a new cause of action not contained in the original declaration. "It is not within the discretion of a trial court to permit an amendment which states a cause of action barred by the statute of limitations"—*Bockoff v Curtis*, 241 Mich 553, 217 N W 750. The Supreme Court therefore reversed the judgment of the lower court—*O'Rourke v Deffenbaugh (Mich)*, 273 N W 749.

## Society Proceedings

### COMING MEETINGS

Alabama Medical Association of the State of Mobile Apr 19 21 Dr D L Cannon, 519 Dexter Ave Montgomery Secretary  
American Association for Thoracic Surgery Atlanta Ga Apr 4 6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary  
American Association of Anatomists Pittsburgh Apr 14 16 Dr George W Corner, 260 Crittenden Blvd Rochester N Y Secretary  
American Association of Genito Urinary Surgeons Atlantic City N J May 2 4 Dr Henry L Sanford 1621 Euclid Ave, Cleveland Secretary  
American Association of Pathologists and Bacteriologists Atlantic City N J, May 3 4 Dr Howard T Karsner, 2085 Adelbert Road Cleveland Secretary  
American Association of the History of Medicine Atlantic City N J May 2 Dr C J G Beardsley, 1919 Spruce St Philadelphia Secretary  
American Association on Mental Deficiency Richmond Va Apr 20 23 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary  
American Bronchoscopic Society Atlantic City N J, Apr 30 Dr Lyman Richards 319 Longwood Ave, Boston Secretary  
American College of Physicians New York Apr 4 8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary  
American Gastro-Enterological Association Atlantic City N J May 2 3 Dr Russell S Boles 1901 Walnut St Philadelphia Secretary  
American Laryngological Association Atlantic City N J May 2 4 Dr James A Babbitt 1912 Spruce St Philadelphia Secretary  
American Laryngological Rhinological and Otolological Society Atlantic City N J Apr 27 29 Dr C Stewart Nash 277 Alexander St Rochester N Y Secretary  
American Neurological Association Atlantic City N J May 2 6 Dr Henry A Riley 117 East 72d St New York Secretary  
American Orthopedic Association Atlantic City N J May 3 5 Dr Ralph K Ghormley, 110 Second Ave S W Rochester Minn Secretary  
American Physiological Society Baltimore Mar 30 Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary  
American Society for Clinical Investigation Atlantic City N J May 2 Dr J M Hayman Jr 2065 Adelbert Road Cleveland Secretary  
American Society for Experimental Pathology Baltimore Mar 30 Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary  
American Society for Pharmacology and Experimental Therapeutics Baltimore Mar 30 Apr 2 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary  
American Society of Biological Chemists Baltimore Mar 30 Apr 2 Dr H A Mattill Chemistry Bldg State University of Iowa Iowa City Secretary  
American Surgical Association Atlantic City N J May 2 4 Dr Charles G Mixer 319 Longwood Ave Boston Secretary  
American Therapeutic Society New York Apr 1 2 Dr Oscar B Hunter 1835 Eye St NW Washington D C Secretary  
Arizona State Medical Association Tucson Apr 21 23 Dr D T Harbridge 15 East Monroe St Phoenix Secretary  
Arkansas Medical Society Texarkana Apr 18 20 Dr W R Brooksher 602 Garrison Ave Ft Smith Secretary  
Association of American Physicians Atlantic City N J May 3 5 Dr Hugh J Morgan Vanderbilt University Hospital Nashville Tenn Secretary  
Congress of American Physicians and Surgeons Atlantic City N J May 3 4 Dr John T King Jr 1210 Eutaw Place Baltimore Secretary  
District of Columbia Medical Society of the Washington May 4 5 Dr C B Conklin 1718 M St NW Washington Secretary  
Federation of American Societies for Experimental Biology Baltimore Mar 30 Apr 2 Dr D R Hooker 19 West Chase St Baltimore Secretary  
Georgia Medical Association of Augusta Apr 26 29 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary  
Louisiana State Medical Society New Orleans May 2 4 Dr P T Talbot 1430 Tulane Ave New Orleans Secretary  
Maryland Medical and Chirurgical Faculty of Baltimore Apr 26 27 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary  
Mississippi State Medical Association Jackson Apr 19 21 Dr T M Dye McWilliams Bldg Clarksdale Secretary  
Missouri State Medical Association Jefferson City May 2 4 Dr E J Goodwin 634 N Grand Blvd St Louis Secretary  
Nebraska State Medical Association Lincoln Apr 26 28 Dr R B Adams Center McKinley Bldg Lincoln Secretary  
North Carolina Medical Society of the State of Pinehurst May 2 4 Dr T W M Long Roanoke Rapid Secretary  
Philippine Islands Medical Association Zamboanga City Apr 19 22 Dr A S Fernando 8 7 Taft Ave Manila Secretary  
Tennessee State Medical Association Nashville Apr 12 14 Dr H H Shoulders 706 Church St Nashville Secretary

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

Tenth Annual Meeting Held in Chicago Nov 5 and 6 1937

The President, DR DAVID P BARR, St Louis, in the Chair

(Continued from page 768)

### Extrarenal Uremia

DRS F H SCHARLES and ABRAHAM SOPHIAN, Kansas City, Mo. The nonprotein nitrogen fraction of the blood can become elevated in conditions other than those affecting the kidney directly, particularly when there is upset of the fluid and inorganic salt balance. It is our purpose in this paper to focus attention on this so-called extrarenal uremia, by presenting three illustrative cases with their clinical manifestations and the laboratory and renal function studies. The first case is one associated with severe diarrhea, the second patient had intractable vomiting after an alcoholic debauch, the third patient used large doses of alkali with resultant alkalosis and elevated nonprotein nitrogen. These returned to normal following the administration of fluids and restoration of the salt balance.

### DISCUSSION

DR GEORGE B EUSTERMANN, Rochester, Minn. There are a number of extrarenal causes for uremia. In addition to those cited, one should also mention severe gastro enteric hemorrhage, protracted vomiting either functional or organic, crises occurring during Addison's disease, and so on. I agree that dehydration, and loss of electrolytes as evidenced by hypochloremia, rather than primary renal injury, are the important underlying factors. The mechanism underlying uremia following hemorrhage apparently is a combination of absorption of blood from the bowel, and transient renal dysfunction, the result of acute anemia. Disease of the kidneys, liver and adrenals greatly enhances disturbances of acid-base equilibrium following the administration of basic and acid salts. Excess administration of salt and fluid causes severe edema of the tissues, especially disadvantageous in cases in which operation is contemplated.

DR W S HOFFMAN, Chicago. Two laboratory procedures that aid in the diagnosis of these extrarenal "uremias" should be mentioned. If the specific gravity of the urine is found to be about 1.030, due allowance being made for albumin it is very likely that the kidney function is normal and that the nitrogenous retention is due to lack of sufficient fluid to produce an adequate amount of urine. The second procedure is not so simple but is more exact: the determination of the serum total base concentration. Values below 150 milliequivalents per liter indicate not only dehydration but also that the loss of sodium has surpassed the loss of water and that the remaining extracellular fluids of the body are hypotonic. Unfortunately, most methods for estimating total base are too difficult and too tedious to be of routine use. As Peters and Van Slyke have pointed out, some idea of the value of the total base concentration can be obtained by adding the chloride and bicarbonate concentrations. In the last few years too methods for serum sodium have been made simpler and should soon be available for clinical laboratories.

DR HUGO A FREUND, Detroit. In certain cases of intracranial tumor, high nitrogen levels are encountered. They are not to be explained on the basis of electrolytic change. In Warthin's festschrift I reported a case in which high nitrogen levels obtained for a long time, when this patient died after operation for brain tumor, normal kidneys were encountered. As an example of the loss of electrolytic fluids those of us who have seen mushroom poisoning (*Amanita phalloides*) noted that nonprotein nitrogen rises as high as 250, subsiding shortly after the acute symptoms have passed.

DR F H SCHARLES, Kansas City, Mo. The alkalinity that is usually present in these cases of lost electrolytes and elevated nonprotein nitrogen is most probably a compensatory affair, an attempt of the body to keep the equilibrium of the system. That has been conclusively shown by Peters. The first loss of electrolytes is chloride with a compensatory rise in the bicarbonate.



### Sodium Chloride Tolerance in Chronic Nephritis Potassium and Sulfate Ions

DR. M HERBERT BARKER, Chicago When sodium chloride was added to the basal constant sodium-potassium chloride-nitrogen sulfur diet in severe cases of chronic glomerular nephritis a rapid rise in blood pressure and a sharp fall in urea clearance were noted. The effect of sodium bicarbonate was somewhat less, but in both cases the addition of ammonium sulfate was associated with a decrease of the blood pressure and an arrest of the falling urea clearance. Substitution of potassium chloride and potassium citrate equal to the amounts of sodium chloride and sodium citrate was attended by an improvement of urea clearance, and a diuresis usually occurred when there was edema. These observations suggest a great intolerance of sodium salts and the beneficial effects of potassium and sulfate ions in the maintenance of the person with a severely damaged kidney.

#### DISCUSSION

DR W E POST, Chicago Sodium salts in large amounts may be dangerous even to the normal patient, and Dr Eusterman has called attention to this critical stage of the administration of salts or alkalis on account of the appearance of edema. In cases in which there is danger of the salt passing into the general body tissues it has seemed to me especially dangerous. Dr W S Hoffman and I did some work about four years ago on edema and found that we could force the sodium out of the tissues by giving low sodium diet and plenty of water. Nephrotic edema disappears quite rapidly in cases of nephrosis. In cases in which there is danger of the tissues holding the sodium, as in infection or some intoxication, the edema increases rapidly. It emphasizes the necessity for taking into consideration the pathologic processes going on in the body, such as infection, and also that somewhat more care be taken in the administration of large quantities of salt.

DR M HERBERT BARKER, Chicago Most of the patients of course had a high grade acidosis. Many of them experienced renal crises with the carbon dioxide falling rapidly. To add to that an acid salt, such as ammonium chloride, will kill the patient. I believe that the sodium injury is associated with sodium retention. Chlorides must not be pushed beyond the optimum normal. Ammonium nitrate is the safer salt to use when one is giving ammonium salts, because it is essentially a neutral diuretic. Dr Post's remarks are timely. When many patients in the second half of life are subjected to surgical operation and receive only 3 to 8 liters of salt solution a day, or from 50 to 80 Gm of salt, there is grave danger.

#### Lipoid Nephrosis

DRS FRANCIS D MURPHY, JOHN GRILL, EDWARD R ANNIS and LOUIS M WARFIELD, Milwaukee The use of the term 'lipoid nephrosis' to indicate a disease separate and distinct from chronic glomerulonephritis has been criticized by some pathologists and clinicians alike. A clinical study of cases over a prolonged period may help to clarify some of the disputed points in connection with the question of the identity of lipoid nephrosis. Nine cases are described which fulfilled the rigid requirements for a diagnosis of lipoid nephrosis. Two of the patients died and were studied post mortem, one is under observation at the present time, and six recovered completely. Microscopic examinations of the kidneys failed to show typical evidence of chronic glomerulonephritis. The length of time these patients were studied varied from three months to fifteen years. Most of them were studied for more than seven years. This report tends to support the view that there is justification for the distinction between lipoid nephrosis and chronic glomerulonephritis. There is ample defense for this on the grounds of the good prognosis of lipoid nephrosis as contrasted to the poorer one in chronic glomerulonephritis. Recently reports by some well known pathologists indicate that lipoid nephrosis is not an atypical form of glomerulonephritis. Our pathologic studies are given and although they are too meager from which to draw final conclusions they support the view that in lipoid nephrosis evidence of chronic nephritis is lacking.

#### DISCUSSION

DR WILLIAM A THOMAS, Chicago I believe that pure lipoid nephrosis is a degenerative process which occurs most

frequently in connection with other degenerative processes, such as infection and certain types of Bright's disease. In the last five years Dr Post and I have made a study of the toxemias of pregnancy at Presbyterian Hospital. All the patients in the antepartum clinic who showed disturbances came into the hospital. There were many cases of albuminuria and edema which turned out to be cases of nephrosis. They are not cases of toxemia of pregnancy. They are induced by the extra load of pregnancy and many clear up during pregnancy. They fulfil all the requirements of lipoid nephrosis. Some have been followed three or four years, some with recurrence and some without recurrence. We have felt that entirely aside from the toxemia of pregnancy many are pure cases of lipoid nephrosis. Many attacks are precipitated by a severe chill. The edema subsides while the blood proteins are far below the limits of normal. In one case that Dr Post and I recorded 55 pounds (25 Kg) of water was lost in fifteen days, while the total serum proteins were 11+ and the serum albumin 0.67 Gm. I have seen complete recovery from edema while the serum albumin would drop below 2 Gm in the blood.

DR LOUIS LEITER, Chicago At present there is no longer the problem of whether nephrosis is a metabolic or a renal disease. It is apparently renal. Although the tubular changes may be striking, it is pretty well established that nephrosis is a glomerular disease primarily, whether degenerative or inflammatory is beside the point. The real criterion in the differential diagnosis would seem to be the duration of the active disease. It is one thing to examine the patient many years after the symptoms have disappeared and to find that the disease has not recurred, but it is another thing to establish recovery in an individual who has had active symptoms for several years. The latter would be most unusual in glomerular nephritis, but unfortunately we do not yet know when the process becomes irreversible. Most of the cases in this series will fall within the doubtful category. It will be noted that patients are reported as having active symptoms for less than three years from the onset of the disease. It is not unusual to see a patient with glomerular nephritis recover after two years of active disease. The only absolute way of settling the diagnosis between mild glomerular nephritis and genuine glomerular nephrosis would be to make biopsies, either during the active stage or shortly after recovery. Pathologic reports of minor inflammatory lesions in the glomeruli at necropsy mean little, since some terminal infection often complicates the situation. Most of the evidence on the inflammatory or degenerative nature of the changes in the glomeruli in patients with so called nephrosis has been based on necropsy material and loses considerable value for that reason. Bell has described subclinical glomerulitis in a large series of cases in which there were infections of one type or another.

DR CLAYTON J LUNDY, Chicago How can the edema in the second case be accounted for? The lantern slide showed a high protein and high albumin fraction.

DR EDWARD ANNIS, Milwaukee It is true that the blood albumin in the last case was not greatly depressed, and there was no reversal of the albumin globulin ratio. Though we studied this case for some time the edema did not fluctuate. The answer to the question is that there is no exact parallelism between the lowering of the blood albumin and the onset and disappearance of the edema.

DR W E POST, Chicago It seems to me that Bright's disease can be divided into three phases and one of them is this phase, one the vascular and one the renal or glomerular phase. A pathologic agent such as infection may do damage which leads to any one of them or any two of them or all three of them. So far as I know there is no impairment of renal function that causes generalized edema such as occurs in nephrosis. Furthermore, when this general tissue damage exists there is a nephrosis, in my opinion the same process associated with kidney damage or glomerular inflammation and it is called nephrotic edema or hemorrhagic Bright's disease or glomerular nephritis, but the kidney may escape damage. In the management if there is infection still active and damage still going on in the tissues, it is very difficult to rid those tissues of edema. If there is no infection and damage has ceased in the tissues, and degeneration is still present and edema still present, then the patient will be soon rid of edema if put



on a low sodium diet and given plenty of water. It seems to me that these particular types of lipid nephrosis are simply ones in which the damage is manifested only in the tissues of the body and are not due to a degenerative form of kidney damage with renal impairment.

#### Colloid Osmotic Pressure in Diseases of the Liver and Relation to Ascites

DRS HUGH R BUTT and ALBERT M SNELL, and ANCEL KEYS, PH D, Rochester, Minn. Many investigators have noted alterations in the concentration of the serum proteins during the course of certain types of hepatic disease. This measurement usually is considered to represent an accurate estimate of the colloid osmotic pressure of the blood serum. In normal man the average size of the protein molecules is fairly constant and the colloid osmotic pressure is therefore fairly closely related to the total protein concentration. In pathologic conditions, however, this relation is often so gross as to be nearly useless for purposes of prediction. We have observed a group of patients with hepatic disease who had ascites and edema and a low colloid osmotic pressure even when the serum protein values were within normal limits. These data indicate that the colloid osmotic pressure measured in the laboratory provides a much better estimate of the effective colloid osmotic pressure in the individual than the measurements of serum proteins, even when the albumin and globulin ratio is also determined. The effect of intravenous administration of solution of acacia on the colloid osmotic pressure of these patients is apparently beneficial.

#### DISCUSSION

DR ROBERT W KEETON, Chicago. Was a normal osmotic pressure found in any patients with cirrhosis who had an associated ascites?

DR A S ALVING, Chicago. There is good evidence that in certain diseases serum albumin and globulin are not of normal quality. The recent work of Hewitt, who has found a new albumin fraction in serum, as well as the studies of blood proteins in nephrosis by Goettsch and Reeves in New York, is at least suggestive that in some diseases there may be abnormal proteins present in the blood and they may have an abnormal osmotic pressure. Have these authors found something of that sort? Has an attempt been made to measure the molecular size of the proteins?

DR J D BOYD, Iowa City. A boy five years ago, at the age of  $6\frac{1}{2}$  years, had typical lipid nephrosis. For relief of his edema he received several injections of acacia, followed by subsidence of the edema. Later, this course was repeated. The boy has returned to the clinic on numerous occasions since his first discharge from the hospital. Even though edema has not been regularly present, albuminuria of considerable degree has persisted. His serum protein value has remained low, with reversal of the albumin-globulin ratio. During this period he has developed enlargement of the liver and spleen, associated for a time with definite evidences of compensatory circulation. During the past few months hypertension has appeared. His serum protein levels do not rise, with transfusions they have fallen to values of less than 2 per cent. We feel that this boy's liver has been damaged through storage of acacia until it no longer is able to function normally, and have thought that his inability to maintain a higher level of serum protein may well depend on the lessened ability of the liver to synthesize protein normally. In view of this experience, we have decided that the use of acacia for prolonged therapy is contraindicated and that conclusions as to its ultimate action must be based on long term observations.

DR GEORGE B EUSTERVAN, Rochester, Minn. The intravenous administration of acacia solution in advanced cases of cirrhosis with ascites which are refractive to the usual diuretic measures has been disappointing so far in a small group of cases that I have observed.

DR W B COOKSEY, Detroit. May I ask Dr Butt whether he has had any reactions following the use of acacia? I recently asked Dr Walter Cannon, who did considerable work on acacia during the war, whether acacia can have a deleterious effect, as it can be demonstrated in the tissues two or three years after

it is injected. He felt that he did not have any deleterious effects. What preparation of acacia has Dr Butt been using in this work? I have not used acacia because of the fear of harmful effects and the possibility of immediate reactions.

DR EDMUND A FOLEY, Chicago. I have some sections showing how the liver resembles loose cotton following the intravenous injection of acacia over a period of time. I have particularly noticed that following injections of acacia the serum protein would decrease. It may be 7 Gm before injection and shortly afterward down to 4 Gm per hundred cubic centimeters. I have not had the opportunity to try this in cirrhosis of the liver. I am therefore interested to know whether the determinations of serum acacia and serum protein were made following injection in cases of cirrhosis.

DR HUGH R BUTT, Rochester, Minn. Concerning normal colloid osmotic pressure in patients who have ascites and edema, such an instance has been reported by Krogh but the diagnosis was somewhat uncertain. Keith and Binger and others have reported cases of edema of indeterminate origin in which all the constituents of the blood, including proteins, were present apparently within normal limits of concentration. We have made no attempt to determine the molecular size of proteins with which we were dealing. Krogh and his co-workers in their early work attempted to determine the size of particles by varying the permeability of the collodion membranes employed, but because of technical difficulties this effort was abandoned. The only reason I mentioned acacia was to demonstrate that for a short time acacia increases the colloid osmotic pressure of the serum under these circumstances. Clinically, no striking improvement was noted in the few cases that I have mentioned. Acacia has been used by Landis and by Binger and Goudschmidt in an effort to relieve nephrotic patients of edema. They have had varying degrees of success. Coburn and Ward in 1925 reported 1,000 successful cases in which 6 per cent acacia saline solution was used without a single fatality, and in 1932 Maytum and Magath reported that 3,000 injections of acacia solution had been given at the Mayo Clinic and that only one slight reaction had occurred. This reaction was apparently due to the presence of some foreign protein in the solution of acacia. Most solutions of acacia do contain a small percentage of nitrogen. The acacia used at the Mayo Clinic is prepared in Dr Osterberg's laboratory from crude gum arabic. I believe that most acacia is imported from the Malay States and Africa. It is best given to patients in 6 per cent acacia saline solution, and in none of the cases in which I have used it have I noticed any reaction. The material must be freshly prepared, because I have noticed that when even autoclaved solutions are kept in the icebox for several weeks a moldy material collects in the bottle. Dr Foley has stated that in dogs given solution of acacia he has been able to produce rather severe damage to the liver. I wonder what amount of acacia he gave to his dogs.

DR FOLEY. One hundred grams.

DR BUTT. That is a much larger dose than we give to man under ordinary circumstances. Serum protein in these patients did not show any appreciable decrease after injection of 300 cc. of acacia solution on three successive days. The slight drop in total proteins and in albumin might be attributed to dilution of the blood. In two of these three cases the amount of acacia in the blood stream was determined by Dr Powers and the decrease in the acacia percentage in the blood paralleled some what the decrease in the colloid osmotic pressure. Dr Keith and his co-workers have reported finding traces of acacia in patients several years after the acacia solution was administered.

#### Experimental Cirrhosis. Relation of Hepatic Damage and Plasma Proteins to Ascites

DR JESSE L BOLLMAN, Rochester, Minn. Experimental cirrhosis was produced in dogs by long continued administration of carbon tetrachloride. Spontaneous ascites occurred only after extensive hepatic damage and was associated with definite changes in the plasma proteins. Moderate plasmapheresis produces ascites in cirrhotic dogs. The extent of the alterations of the serum proteins necessary to produce ascites appears to be inversely proportional to the extent of hepatic damage present.

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (\*) are abstracted below.

#### Alabama Medical Association Journal, Montgomery 7 249 280 (Jan.) 1938

- The Patient as a Personality F A Kay Tuscaloosa—p 249  
Treatment of Fractures of Surgical Neck and Shaft of Humerus A C Jackson Jasper—p 253  
\*Mechanical Treatment of Cervical Arthritis S R Terhune Birmingham—p 255  
Management of Occiput Posterior Positions T L Bennett Jr Florence—p 256  
Sterility Study with Uterotubal Insufflation Apparatus A Few Male Faults Mentioned G F Douglas Birmingham—p 259

**Mechanical Treatment of Cervical Arthritis**—Terhune has had twenty one cases presenting symptoms of pain in the cervical region, shoulder girdle, arm or, more rarely, the precordium, referred to him for "neck stretching," as described by Hanflig in THE JOURNAL Feb 15, 1936, page 523. After careful examination of each patient he subjected ten to repeated neck stretchings. These ten showed, by x-ray examination, definite signs of cervical arthritis. All have obtained some measure of relief. The other eleven, a few of whom had x-ray evidence of cervical arthritis, also demonstrated active foci of infection in the form of tonsillitis, pharyngitis or sinusitis and were referred to other physicians for eradication of these foci. All these patients have obtained relief from their pain after elimination of the infection. The use of "neck stretching" as a differential diagnostic test, in cases of demonstrable cervical arthritis in the presence of an active focus, is conceivably logical and has been used in one case. Three series of neck stretchings gave no relief and so it was assumed that the pain was not due to root pressure. Tonsillectomy was advised and done three weeks later with complete alleviation of pain shortly afterward.

#### American Heart Journal, St Louis

14 643 788 (Dec.) 1937

- Study of Renal Arteries in Relation to Age and to Hypertension R H Williams and T R Harrison Nashville Tenn—p 645  
\*Results from Trichlorethylene Inhalations in Anginal Syndrome of Coronary Sclerosis F A Willis and T J Dry Rochester Minn—p 659  
Hemodynamic Studies in Experimental Coronary Occlusion IV Stellate Ganglionectomy Experiments G Schauer L Gross and L Blum New York—p 669  
Electrocardiographic Changes in Dog Following Sudden Occlusion of Left Anterior Descending Coronary Branch Under Various Experimental Conditions L Gross and B Calef New York—p 677  
Infection of the Heart Morphologic and Clinical Appraisal of 300 Cases Part I Predisposing and Precipitating Conditions W B Bean Boston—p 684  
Incidence of Myocardial Infarction Without Pain in 200 Autopsied Cases J A Kennedy Boston—p 703  
Thiocyanate Therapy in Hypertension Including a New Micromethod for Determining Blood Thiocyanates J Q Griffith Jr and M A Indauever with technical assistance of R Campbell Philadelphia—p 710  
Reciprocal Rhythm in Patient with Congenital Heart Disease F B Cuts Providence R I—p 717  
Studies of Collateral Circulation Following Experimental Vascular Occlusion I D Stein Mount Vernon N Y—p 726  
Complete Auriculoventricular Block and Auricular Flutter with Observations of Effect of Quinidine Sulfate L F Jourdonais and H O Moenthal New York—p 735

**Trichlorethylene Inhalations in Anginal Syndrome**—In determining the effect of inhalations of trichlorethylene on the anginal syndrome of coronary sclerosis, Willis and Dry observed forty such patients. Sixteen months has elapsed since the beginning and five months since the close of the observation. With three exceptions the patients remained ambulatory and were away from home and their accustomed responsibilities and may have been under conditions more conducive to

rest and relaxation than would be the case were they treated in their respective communities. The results do not permit this method of treatment to be accepted with enthusiasm. In eighteen cases varying degrees of improvement occurred. However, when the results are analyzed critically it is found that only one patient obtained complete relief, while the others had fewer attacks of less severity. In five cases temporary improvement was noted, but a return of the previous symptoms occurred while the treatment was still in progress. It is possible that a new hope in undertaking the treatment influenced this attitude, although care was taken not to create any false hopes. In thirteen cases no improvement was observed. These patients received treatment from one to seven months. Four patients died during the course of treatment. All deaths occurred suddenly. Two of the patients who died were temporarily benefited. While the results obtained with this method of treatment have been disappointing, it is however a procedure that warrants a trial when the usual therapeutic agents have failed to give relief. The drug is well tolerated and its administration appears to be perfectly safe.

#### American Journal of Public Health, New York

28 1116 (Jan.) 1938

- An Equal Opportunity for Health H H Lehman Albany N Y—p 1  
Familial Aggregation of Infectious Diseases W H Frost Baltimore—p 7  
A State Cancer Program H D Chadwick and H L Lombard Boston—p 14  
Diabetes An Important Public Health Problem C F Bolduan New York—p 21  
Determining Population in Intercensal and Postcensal Years by Means of Continuous Population Registers Dorothy Swaine Thomas New Haven Conn—p 28  
Epidemic Diarrhea of the New Born III Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New Born Babies in Hospital Nurseries S Frant and H Abramson New York—p 36  
\*Experiments on Antirabic Vaccination with Tissue Culture Virus L T Webster New York—p 44  
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**Antirabic Vaccination with Tissue Culture Virus**—To find a safe and effective antirabic vaccine, Webster carried out the following experiments. Mice of a selected Swiss strain were chosen as test animals. The mice could be readily immunized against an intracerebral injection of test virus containing up to 10,000 lethal doses. A single intraperitoneal injection of at least 1,000 intracerebral lethal doses rendered mice resistant within fourteen days and over a period of at least nine months. Neutralizing antibodies were likewise present. Various commercial preparations were then examined with respect to their immunizing capacities. None immunized the mice when given according to directions in a single dose in a quantity at least ten times that administered to dogs per gram of body weight. The possibility of a new source of vaccine was investigated. Preparations in current use are composed largely of virus-containing brain or cord tissue of rabbits, sheep or monkeys. In 1936, however, the propagation of rabies virus in culture mediums outside the animal body was reported by Kanazawa and by Webster and Clow. The author's cultures have been continued unrelentingly now for ninety-five passages and have become uniformly virulent through the 1:10,000 dilution. This culture virus was tested for its ability to immunize mice. Of the undiluted culture, 0.25 cc, equal to 80,000 intracerebral lethal doses, was harmless when injected intraperitoneally and protected the mice in fourteen days against an intracerebral test injection of 1,000 lethal doses of mouse brain virus. One tenth of this amount of culture vaccine was likewise effective, but one one-hundredth containing only 800 lethal doses, was insufficient for immunization. Immunity when produced, endured at least nine months and was accompanied by protective antibodies. Attempts were then made with culture virus to immunize beagle puppies. Dogs were vaccinated with relatively small amounts of culture virus from 5,000 to 20,000 lethal mouse doses, barely twenty times that required to immunize mice. The vaccine

has proved harmless to all forty-five dogs thus far treated and has immunized them as follows. Fourteen vaccinated dogs resisted one lethal dose of test skunk virus fatal to nine of eleven controls. Likewise, three of six vaccinated dogs resisted ten lethal doses fatal to all five tested controls. The 15,000 lethal mouse doses of culture vaccine which immunized dogs against one test lethal brain dose can be contained in 1 cc and can be increased apparently without harm to 1,000,000 lethal mouse doses. With a larger amount of lethal mouse doses in the vaccine a greater resistance is expected.

**Relation of Lymphocytic Choriomeningitis to Acute Aseptic Meningitis**—Baird and Rivers present evidence (sixty-five cases) which indicates that not all cases of acute aseptic meningitis (Wallgren) are caused by the virus of lymphocytic choriomeningitis. The etiologic agent or agents responsible for the cases not so induced are not known. From the records of three patients with lymphocytic choriomeningitis it appears that certain cases of the disease, because of the extent of paralysis and sequels, do not satisfy the criteria laid down by Wallgren for the diagnosis of acute aseptic meningitis. It is difficult or impossible to differentiate by clinical means alone the cases of acute aseptic meningitis caused by the virus of lymphocytic choriomeningitis from those not produced by the agent, however, the spinal fluid cell counts in the cases studied tend to be higher in the former group than in the latter. Children and even infants are not infrequently attacked by the virus of lymphocytic choriomeningitis.

### Am J Roentgenol & Rad Therapy, Springfield, Ill

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**X-Ray Irradiation of Hypophysis in Experimental Diabetes**—Since the hypophysis elaborates a diabetogenic hormone and its removal reduces the severity of experimental diabetes, Johnson and his co-workers thought that heavy doses of x-rays directed to the gland might produce similar results. Seven dogs were rendered diabetic by removal of the pancreas. After recovery from the operation the animals were kept on a basic diet of dog biscuits, sugar and ground meat to which were added liberal amounts of fresh or dried pancreas. On this stock diet 2 units of insulin per kilogram of body weight was given twice daily at the time of feeding. The animals were seldom given sufficient insulin to render them sugar free yet they were never permitted to show marked glycosuria or ketonuria. Prior to periods when the tolerance to dextrose and insulin was determined, the animals were maintained in a constant diabetic state. To test the animals' sensitivity to insulin food and insulin were withheld for twenty hours during the period of controlled diabetic state. From 2 to 2½ units of insulin was then administered and the animal was observed over a period of four hours to see whether convulsions occurred. Following control tolerance tests the animals were given varying doses of x-rays to the hypophyseal area through one dorsal and two lateral portals, each 5 cm square. The physical constants employed were 140 kilovolts (mechanical

rectification) with 5 milliamperes, a focal skin distance of 50 cm, 0.5 mm of copper and 1 mm of aluminum filtration. With these constants the Coolidge tube delivered 5.8 roentgens per minute. The total dose given the hypophysis varied between 750 and 2,025 roentgens for a single treatment. Subsequent dextrose and insulin tolerance tests were carried out at weekly intervals following irradiation. The data show a wide variation in the fasting blood sugar of most of the animals following irradiation. The irradiation did not render the animals hypersensitive to insulin during fasting, for convulsions never occurred in any of the animals given 2 units of insulin per kilogram of body weight, and all animals but one tolerated 25 units. Glycosuria was not greatly reduced by irradiation. The two heaviest irradiated animals eliminated dextrose in amount nearly maximal for starving depancreatized animals. Microscopic studies made on six of the seven animals irradiated indicate that the hypophysis was seriously damaged by the treatment. The gland was impaired in four, as indicated by edema and degeneration of the cells of the pars tuberalis. The nerve structures of the brain, however, showed more clearly the effects of the massive irradiation. Thus, the cortex of all animals and the midbrain of those animals receiving 1,500 roentgens or more of radiation were definitely damaged.

### American Journal of Surgery, New York

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\*Eucupine (Isoamylhydrocupreine) as Local Anesthetic in Proctologic Surgery and in Treatment of Pruritus Ani S D Manheim New York and M M Marks Kansas City Mo—p 86  
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\*Sex Hormone Therapy for Prostatism R V Day H W Martin A A Kutzmann and E E Kessler Los Angeles—p 100  
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New Sclerosing Drug for Varicose Veins—Monolate S T Glasser New York—p 120

**Eucupine as Anesthetic in Treatment of Pruritus Ani**—Manheim and Marks found 0.1 per cent eucupine dihydrochloride with 1 per cent procaine hydrochloride in saline solution a reliable anesthetic for minor rectal surgical procedures. Anesthesia is rapid and is not attended by tissue reactions, irritation or evidence of any systemic effects. The anesthesia and postoperative analgesia produced persist from three to seven days without the addition of epinephrine. The employment of this solution requires no special technique and it can be used to maintain prolonged regional anesthesia as a supplement to inhalation, spinal or intravenous anesthesia. No evidence of delayed healing has been encountered. Eucupine in oil requires special technique in its use to avoid pooling. The formula has been employed successfully in a variety of anal conditions both for treatment and for surgical repair. Its greatest value is in the treatment of pruritus ani, as the infiltration may be repeated as often as the condition demands. The analgesic effect of a single injection usually persists from two to six weeks and local tissue reactions are rare when the substance is properly used.

**Endocrine Therapy for Prostatism**—Day and his colleagues state that two testicular hormones have been isolated in pure crystalline form, androsterone and testosterone, the exact chemical constitutions of which have been determined, and have both been prepared synthetically, together with a number of intermediate substances. Their clinical results in forty cases practically parallel those of Lower, Van Capellen and Laqueur and show some clinical improvement in about 50 per cent of carefully selected patients, whose residual urine did not exceed 100 cc. Most of their observations during the past fifteen months have been based on the clinical use of the synthetic testosterone propionate. The preparation is dissolved in oil of sesame and is nonirritating when injected intramuscularly. Use of this substance is frequently invaluable in feeble and very old men to tide them over certain emergencies, such as cystostomies, which may be imperative. It may be used to advantage in castrates. The use of testosterone is seemingly effective in bringing about clinical improvement in a large percentage of patients with benign prostatic hypertrophy, in inhibiting hyperplasia and holding it in check at least temporarily. Its use is still in the experimental stage, and more clinical and experimental data are necessary before definite conclusions can be ventured.

### Archives of Internal Medicine, Chicago

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- Severe Anemia of Aplastic Type Associated with Sclerosis of Thyroid Gland. R. H. Jaffe. Chicago.—p. 19
- \*Gonococcal Endocarditis. Study of Twelve Cases with Ten Postmortem Examinations. R. H. Williams. Nashville, Tenn.—p. 26
- Mitral Stenosis. Correlation of Electrocardiographic and Pathologic Observations. K. Berliner and A. M. Master. New York.—p. 39
- Gastro-Intestinal Manifestations of Lymphogranulomatosis (Hodgkin's Disease). E. D. Sherman. Sydney, Nova Scotia.—p. 60
- \*Immediate Effect of Tincture of Digitalis on Emptying Time of Human Stomach. E. J. Van Liere and C. K. Sleeth. Morgantown, W. Va.—p. 83
- Urea Clearance in Pernicious Anemia. P. J. Fouts and O. M. Helmer. Indianapolis.—p. 87
- Experimental Endocarditis Due to *Streptococcus Viridans*. Biologic Factors in Its Development. M. Friedman, L. N. Katz and K. Howell with collaboration of E. Lindner and M. Mendlowitz. Chicago.—p. 95
- Experimental Peptic Ulcer Produced by Cinchophen. J. L. Bollman, L. K. Stalker and F. C. Mann. Rochester, Minn.—p. 119
- Allergy. Review of Literature of 1937. F. M. Rackemann. Boston.—p. 129

**Gonococcal Endocarditis**—Williams comments on twelve cases of gonococcal endocarditis, in ten of which a postmortem study was made. Gonococcal endocarditis constituted 26 per cent of all instances of acute bacterial endocarditis in patients admitted to the Vanderbilt University Hospital in the last twelve years. It was observed in 0.7 per cent of 1,719 necropsies performed during this period. It occurred in all age groups and was more frequent in men. The onset was sometimes insidious, consisting of generalized aching, malaise and fever. In other patients there occurred high fever, chills, petechiae and articular pains. Acute polyarthritides was usually the first focal manifestation of generalized gonococcal infection. Petechiae usually occurred early in the disease and frequently recurred in showers. Large petechiae with necrotic centers are suggestive of endocarditis. Renal complications frequently embolic were commonly present. The temperature usually showed marked daily fluctuations. Signs of valvular disease appeared in every instance during the illness. Myocarditis sometimes occurred. The liver and spleen were often enlarged and jaundice was present in five instances. Marked leukocytosis and moderate or severe anemia occurred. The urine frequently contained moderate amounts of albumin, red blood cells, white blood cells and casts. Uremia was a common development and was the main cause of death in 42 per cent of the patients. The average duration of the endocarditis was five weeks. A correct diagnosis of gonococcal endocarditis can be established only after close clinical observation and careful bacteriologic studies. Repeated cultures on special mediums are often necessary to recover gonococci from the blood. Electropneumia and chemotherapy (sulfanilamide) seem to offer some therapeutic promise.

**Effect of Digitalis on Emptying Time of Stomach**—Van Liere and Sleeth found that 5 cc of tincture of digitalis when mixed with a standard test meal (consisting principally of 15 Gm of farina) decreased the normal emptying time of the stomach on an average of 18.5 per cent in seven healthy young men. In no case was the decrease in the emptying time less than 12.9 per cent, and the greatest decrease noted was 24.6 per cent. Since tincture of digitalis appears capable of decreasing the emptying time of the stomach, it may be given immediately before or directly after a meal without any deleterious effect on gastric motility. Experimental evidence is offered which throws light on the causation of the diarrhea which often accompanies the administration of digitalis. Since digitalis is often given in conditions associated with anoxemia, which has been shown to inhibit gastric motility, the fact that it is capable of decreasing the emptying time of the stomach is of practical importance.

### Arch. of Physical Therapy, X-Ray, Radium, Chicago

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- Deformities Following Fracture. Their Prevention and Treatment. M. S. Henderson. Rochester, Minn.—p. 7
- Short Wave Treatment of Endocrine System. Diencephalon and Mesencephalon. J. Samuels. Amsterdam, Netherlands.—p. 13
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- Restoration of Muscle Balance in Treatment of Sciatic Pain. R. E. Lenhard and H. O. Kendall. Baltimore.—p. 44

### Delaware State Medical Journal, Wilmington

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- Practical Points in Relation to Clinical Surgery. W. W. Babcock. Philadelphia.—p. 1

### Endocrinology, Los Angeles

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- \*Effects of Parathyroid Extract and of Vitamin D on Blood Phosphatase. Calcium and Phosphorus in Osteogenesis Imperfecta. A. E. Hansen, I. McQuarrie and Mildred R. Ziegler. Minneapolis.—p. 1
- Experimental Acute Hyperparathyroidism. II. Morphologic Changes. A. Cantarow, H. L. Stewart and E. I. Housel. Philadelphia.—p. 13
- Relative Effectiveness of Emmenin, Estriol, Glycuronide and Estriol in Immature and Castrate Immature Rat. R. R. Greene and A. C. Ivy. Chicago.—p. 28
- Changes in Electrical Potential During Estrous Cycle of Rat. II. Partial and Complete Hypophysectomy and Pituitary Replacement Therapy. P. V. Rogers. New Haven, Conn.—p. 35
- \*Estimation of Ovarian Activity by Consecutive Day Study of Basal Body Temperature and Basal Metabolic Rate. B. B. Rubenstein, Cleveland.—p. 41
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- Effect of Thyrotropic Hormone Alone and with Other Substances on the In Vitro Oxygen Consumption of Thyroid and Liver. A. Canzianelli and D. Rapport. Boston.—p. 73
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- Analysis of Amenorrhea by Use of Commercial Prolactin and Luteinizing Hormone. I. T. Nathanson and H. I. Fexold. Boston.—p. 86
- Influence of Light on Hypophysis. Effects of Long Continued Night Lighting on Hypophysectomized Female Ferrets and Those with Optic Nerves Cut. T. H. Bissonnette. Hartford, Conn.—p. 92

**Parathyroid Extract and Vitamin D in Osteogenesis Imperfecta**—Hansen and his associates investigated the effects of parathyroid extract and of large doses of vitamin D on the phosphatase activity of the blood in four cases of osteogenesis imperfecta, correlating results with possible changes in the calcium, phosphorus and proteins of the serum and with variations in the calcium and phosphorus balances measured simultaneously. The ages of the patients were 12, 3, 9 and 7 years, respectively. The plasma phosphatase activity of these patients was found to be within normal limits under ordinary conditions.

but was greatly depressed by both parathyroid extract and viosterol. The serum calcium, on the other hand, was definitely increased by both agents. The inorganic phosphorus of the serum was decreased by the administration of parathyroid extract in three cases and increased slightly in one. The level of serum inorganic phosphorus was not significantly altered by the viosterol except in the case of the youngest patient. In this instance it was merely increased from a subnormal to a normal level. The serum proteins were unchanged by either parathyroid extract or viosterol. Generally, the effects of parathyroid extract and of large doses of viosterol were alike in producing negative balances of phosphorus and calcium in these cases as they do in normal subjects. Such agents are therefore contraindicated in osteogenesis imperfecta because they tend to accentuate the functional disturbance already present. Therapeutic procedures which would increase the phosphatase activity might, on the other hand, have a beneficial effect in this disorder.

**Ovarian Activity and Basal Metabolic Rate**—The existence of the temperature cycle suggested the possibility that a metabolic cycle might also be present. Rubenstein presents the data in a study of the basal metabolism rate of fifteen young adult women. The basal metabolic rate was taken in duplicate, the Benedict-Roth machine being used and the usual precautions being taken. The basal metabolic rate fluctuates widely but regularly during the menstrual cycle, the lowest values occurring just before the middle period (about the thirteenth day of a twenty-eight day cycle). The basal body temperature also varies in the same way, the low point coinciding with the most highly cornified (ovulatory) vaginal smear. Body temperature and basal metabolic rate seem to be equivalent measures of ovarian activity.

### Georgia Medical Association Journal, Atlanta

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### Journal of Biological Chemistry, Baltimore

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\*Dashboard Dislocation of Hip Report of Twenty Cases of Traumatic Dislocation R. V. Funsten P. Kinser and C. J. Frankel Charlottesville Va.—p. 124  
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**Chondrodysplasia (Ollier's Disease)**—Sanderson and Smyth report a case in which the resemblance of chondrodysplasia to osteitis fibrosa cystica might lead to confusion as to the diagnosis. The involvement is both symmetrical (legs) and asymmetrical (arms) and clearly demonstrates that symmetry is of no diagnostic import. The disease consists of cartilaginous lesions, which tend to become grouped, first, in the individual long bones, and, second, in the extremities. When more than one extremity is involved, the tendency to affect whole extremities naturally results in either symmetry or asymmetry. The disease runs a characteristic course and reaches a stage in which the ends of some of the long bones become expanded, grossly deformed and shortened. In the case reported, the deformity became evident at the third year but did not become prominent until later. There was a gradual steady increase in the extent of the individual lesions, as well as some spread in their distribution. There is at no time in the course of the disease a stage in which it resembles multiple cartilaginous exostoses, called also "hereditary deforming chondrodysplasia." Differentiating Ollier's disease on the basis of asymmetrical distribution adds to the confusion. It would seem much more logical to group all the endochondral cases under the term "Ollier's disease" or possibly "endochondrodysplasia." Those associated with exostoses or ecchondral cases could then be termed "ecchondrodysplasia." The calcium balance in the case reported was within normal limits, thus further differentiating the condition from osteitis fibrosa cystica, which it resembles slightly. This would indicate that, if any enlarged parathyroids are found in such cases, they are due to secondary hyperplasia and should not be removed. Treatment at the present time is largely that of corrective orthopedics.

**Dashboard Dislocation of Hip**—Funsten and his associates use the name "dashboard" dislocation of the hip because the person so injured was usually sitting beside the driver of an automobile when it came to an abrupt stop in a collision. In such a case, since the hip is in a flexed and adducted position, the force of the impact of the tibia or of the knee against the panel is transmitted through the femur to the posterior rim of the acetabulum, and the result may be a simple dislocation or a dislocation with fracture of the lip of the acetabulum. Occasionally a fracture of the tibia or of the patella is experienced instead. This mechanism was the cause of dislocation in thirteen of the twenty cases reported. In the remaining seven two patients were thrown out of automobiles, two were struck by automobiles, one patient fell from a tree, one fell from a box car and one was injured at birth. The routine method of

treatment in the fresh cases was immediate closed reduction, followed by traction of the Russell or Buck type. If there was a formidable fracture of the acetabulum, the traction was maintained for eight weeks. If, however, no acetabular fracture existed, traction lasted only from two to three weeks. During the period of traction in both instances, active motion was maintained in the knee and the hip joints. Treatment of the old cases required much more active correction, and the results were discouraging. The end results were good in eleven cases, fair in two, poor in five and undetermined in two.

**Amniotic Fluid Concentrate in Orthopedic Conditions**—It occurred to Shimberg that if human and bovine amniotic concentrate was effective in hastening the process of repair within the peritoneum it ought to be of value in other serous cavities, including those of the joints of the body. Amniotic fluid concentrate was used within the joint cavities in sixty-eight cases of various pathologic conditions of the joints. The concentrate was obtained by concentrating, fractionating and purifying the amniotic fluid of cows which are from two to four months pregnant. The concentrate appears to influence favorably the mechanism of defense repair. It contains allantoin in small amounts, and allantoin is of value in promoting repair. Amniotic fluid is a body fluid, and one of its functions is to prevent adhesions between the fetus and the amniotic sac. Its use within joint cavities accomplishes several purposes. 1. It distends the cavity with an innocuous fluid, and this mechanical distention separates to some extent the injured surfaces. 2. It excites an immediate defense reaction in the intra-articular tissues, with the formation of much fibrin, and at the same time reduces oozing time to a minimum. As the defense reaction wanes, a repair process is stimulated. Apparently the normal body process of defense and repair is enhanced with a resultant early resolution, thereby limiting fibrous adhesions. 3. The fluid influences intra-articular viscosity, and the lubricant factor in joint function is favorably affected. The results obtained by arthrotomy after injection of this fluid compare favorably with those of others as regards postoperative complications, time of functional restoration and final end results. In fractures of the intra-articular type, there is no doubt that the fluid has definite value. In atrophic arthritis it seems indicated when there is effusion or marked involvement of the synovial membrane. The observations indicate that amniotic fluid concentrate has some value in orthopedic disabilities.

### Journal-Lancet, Minneapolis

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Homonymous Hemianopsia With and Without Sparring of Macula in Lesions of Visual Cortex C Hynes Minneapolis—p 20  
Some Facts and Comments on Physical Therapy Review of Literature A Stolinsky Lisbon N D—p 23

**Hypertonic Dextrose Solutions in Bronchial Asthma**—Stoesser and Cook observed three children with histories of bronchial asthma from seven to eight years, in whom epinephrine failed to give satisfactory results, over a period during which they received intravenously hypertonic solutions of dextrose, sodium chloride and sucrose. The asthmatic attacks due to ingestants responded favorably to the dextrose, while those due to inhalants were not controlled satisfactorily. A child without an associated infection tolerated the dextrose solutions much better than the children with secondary infections. The fact that the dextrose was administered as a hypertonic solution did not appear to aid in determining the mechanism of control of the asthma due to food allergy. The sodium chloride solution was not used in the inhalant. Preliminary investigations have shown that high salt diets tend to precipitate attacks of asthma. Hypertonic sucrose solutions, however, were tried as a substitute, but they were unsuccessful in controlling asthmatic attacks. The variation in the response to dextrose depending on the etiology of the asthma may open a new avenue of approach to the study of the underlying mechanism

in allergic disease. The severity of the asthmatic attacks in the cases which have not responded satisfactorily to the carbohydrate therapy appears to be influenced by shifts in the sodium chloride intake in the diet. This offers a new form of therapy.

### Journal of Pediatrics, St Louis

11 743 886 (Dec.) 1937

- Acute Infective Polyneuritis in Childhood M S Hecht Baltimore—p 743  
\*Dural Sinus Thrombosis in Early Life I Clinical Manifestations and Extent of Brain Injury in Acute Sinus Thrombosis O T Bailey and G M Hass Boston—p 755  
Epidemic Diarrhea of the New Born II Control and Prevention of Outbreaks in Hospital Nurseries S Frant and H Abramson New York—p 772  
Antirachitic Value of Irradiated Evaporated Milk in Infants An Outpatient Study M Rapoport Elizabeth Krick and J Stokes Jr, Philadelphia—p 782  
Cretinoid Epiphyseal Dysgenesis W A Reilly and F S Smyth San Francisco—p 786  
Intracranial Hemangioma Associated with Facial Nevus A O Hecker Polk Pa—p 797  
Comparative Study of Levinson and Tryptophan Tests as Aids in Diagnosis of Tuberculous Meningitis F A Guistra Brooklyn—p 805  
\*Lymphogranuloma Venereum in Childhood Review of Literature with Report of Case H Levy Brooklyn—p 812  
\*Drugs Transmitted Through Breast Milk Part I Laxatives R M Tyson E A Shrader and H H Perlman Philadelphia—p 824  
Further Suggestions for Approaching Children and Their Parents Part II E L Vincent Detroit—p 833

**Dural Sinus Thrombosis in Early Life**—Bailey and Hass correlate the extent of brain injury with the localization of the thrombi in the venous sinuses and their tributary veins in eighty cases of thrombosis of the dural venous sinuses in children, all but three of whom were less than 3 years of age. Especial attention is given to the large group of infants and children in whom the thrombosis could not be attributed to the localization of a demonstrable infectious agent in the sinus wall or tributary veins. Forty-two cases were associated with various forms of sepsis, meningitis, scalp infections, otitis media, mastoiditis and bacteremias without meningeal localization. Four instances followed surgical procedures. Thirty-three patients presented no evidence of infection of the central nervous system or blood stream. They were all infants less than 30 months of age. The illness began with an acute nutritional disturbance usually followed after a period of days or weeks by evidences of meningeal irritation, marked hyperpyrexia and convulsions or other abnormal neurologic manifestations. Some infants died without any evidence of neurologic disturbance. In all these patients the superior longitudinal sinus was thrombosed in its entirety or in part with variable involvement of other sinuses and cerebral veins. Twenty-one of the patients presented hemorrhages into the meninges associated in nineteen cases with intracerebral hemorrhage and necrosis. Some of the patients succumbed within a few hours after the onset of the symptoms referable to involvement of the central nervous system. A few lived for ten days to one month. Finally, two patients recovered from their acute attacks and died later with organized and canalized thrombi in their superior longitudinal sinuses.

**Venereal Lymphogranuloma in Childhood**—Levy discusses the nine reported cases of venereal lymphogranuloma in children and includes observations on one additional case. Of the ten collected cases nine were in girls and one in a boy (doubtful). The ages ranged from 2 weeks to 14 years. In none was there a history of sexual contact. In none of the childhood cases was the primary lesion described. Of the nine girls six showed inguinal adenopathy, only one had inguinal and rectal pathologic changes and only one had rectal stricture alone. The ninth patient was an infant in whose parents the disease was proved. In one case there had been an obvious cause for direct implantation of the virus into the rectum since an enema tip used by the mother was used for the child. At least several more of the girls may have had a vaginal discharge which was not observed and the urethral route (and consequently the inguinal route) is the most likely in these cases of acquired venereal lymphogranuloma in girls. Though the course is invariably chronic the ultimate prognosis seems good, since of the ten patients six are clinically well (except



for surgical scars), one required major surgical intervention with cure, two give no record of the outcome and the tenth is the infant whose parents were affected. The therapy usually advocated is radical and complete extirpation with subsequent x-ray or quartz-lamp therapy. A characteristic early transitory vaginal discharge with urethritis accompanied by inguinal adenitis should cause one to suspect the diagnosis of venereal lymphogranuloma.

**Drugs Transmitted Through Breast Milk**—If the breast milk can be used to introduce remedies of therapeutic value to the nursing, such a procedure, by proper regulation, may prove an excellent method of therapy. With this in mind Tyson and his associates carried out a study on laxatives. A questionnaire was mailed to 500 pediatricians and obstetricians, 351 answers were returned. There were 115 affirmative and 192 negative answers as to specific instances in which cathartics administered to lactating mothers were transmitted through their breast milk and produced a laxative effect or colic in the nurslings. There were fifty specific instances in which fresh fruit in season, canned fruit or foods taken by a lactating mother produced a laxative effect or colic in her nursing. There also were seventy-six positive instances in which drugs other than cathartics or laxatives administered to lactating mothers produced an untoward effect in the nurslings. After a physical examination, patients in the maternity ward of Temple University Hospital were endorsed for the study of the possible transmission of laxatives to nurslings through breast milk. From chemical analyses no trace could be found of the transmission of phenolphthalein, calomel, senna or rhubarb through breast milk. Aloin gave positive evidence of transmission through breast milk, but 87.5 per cent of the positive cases gave no clinical evidence of affecting the child. The quantities transmitted were too small for any laxative action. Cascara gave both chemical and clinical evidence of transmission. In the cases of aloin, phenolphthalein and calomel the clinical evidence in the chemically controlled series is in accordance with that found in the preliminary series. Rhubarb gave no clinical evidence whatever and it is concluded that no transmission takes place.

### Kentucky Medical Journal, Bowling Green

36 138 (Jan.) 1938

- Acute Osteomyelitis J D Hancock Louisville—p 19
- Urinary Retention E O Guerrant Winchester—p 21
- Lobar Pneumonia W J Shelton Mayfield—p 25
- Role of Electrocardiogram in Diagnosis Prognosis and Management of Cardiac Infarction C N Kavanaugh, Lexington—p 28
- Some New Developments in Application of Plastic Surgery to Accident Cases R C Pearlman Louisville—p 30
- Colloidal Sulfur Therapy R T Ballard Harrodsburg—p 34

### Minnesota Medicine, St Paul

21 178 (Jan.) 1938

- Unilateral and Bilateral Carcinoma of the Breast (Including Paget's Disease) Results Three Five Ten, Fifteen and Twenty Years After Operation S W Harrington Rochester—p 1
- New Automobiles and New Fractures H B Macey Rochester—p 9
- Peripheral Nerve Injuries A A Zierold Minneapolis—p 14
- Treatment of Burns R F McGandy Minneapolis—p 17
- Certain Derangements of the Knee Joint C C Chatterton St Paul—p 23
- \*Improved Treatment for Os Calcis Fractures O W Yoerg Minneapolis—p 28
- Physical Therapy in Relation to Industrial Medicine F H Krusen Rochester—p 30

**Treatment for Os Calcis Fractures**—Using a method evolved three years ago, Yoerg has been able to obtain improved anatomic and functional results and, in the ordinary type of os calcis fracture men have returned to work within three months from the time of reduction. The method consists of manually disimpacting the fracture, bringing the heel down by pulling the sole of the foot, with a sudden thrust against a firm vertical bar, and the use of an os calcis compression clamp to overcome the broadening of the heel and to replace the loosened bones to their normal or near normal position. This is followed by the application of a well molded boot cast. After reduction and the application of the cast the patient is placed in bed with the foot elevated. He is kept in bed for three or four days or until pain has disappeared when he is allowed to be up and about on crutches. He is discharged from the hospital but no weight bearing is permitted. Four weeks after reduction

the patient returns and the cast is removed. Roentgenograms will show that union is taking place and that it is sufficiently strong so that a cast is no longer necessary. The patient is then instructed to massage and actively and passively move the foot and ankle, particularly to evert and invert the foot to bring about a return of motion in the subastragalar joint. He continues this massage and manipulation for four weeks without weight bearing. He returns at the end of four weeks and roentgenograms taken then will show that union is firm. He is allowed to walk on the injured foot, using his crutches. In a few days or a week the crutches are discarded. In thirty-one cases there has been one failure.

### New England Journal of Medicine, Boston

218 97 142 (Jan 20) 1938

- Bronchiectasis Physical and Psychologic Manifestations E D Churchill Boston—p 97
- New Method of Dealing with Tunnel Chest P E Truesdale, Fall River Mass—p 102
- Rights and Lefts in Medical Practice R I Lee Boston—p 107
- Treatment of Vomiting of Early Pregnancy D E Reid and H M Teel Boston—p 109
- Low Thigh Amputation Technic Employed in Elderly Patients Particularly Those with Advanced Peripheral Vascular Disease or Diabetic Gangrene G E Haggart and G G Bailey Boston—p 113
- Intravenous Evipal Sodium Anesthesia in Urologic Surgery J E Dunphy and J H Harrison Boston—p 117
- \*Human Autonomic Pharmacology XVI Benzedrine Sulfate as an Aid in Treatment of Obesity M F Lesses and A Myerson Boston—p 119

**Benzedrine Sulfate in Treatment of Obesity**—Lesses and Myerson, after initial study, placed a group of seventeen unselected private patients, with a primary complaint of obesity, on a measured, unweighed diet of about 1,400 calories. No patient was urged to follow the diet or to do otherwise than obey his natural desire. All patients were observed at intervals of from seven to fourteen days. All reported symptoms were noted. Careful regulation of the dosage prevented reactions. The most satisfactory plan of treatment was to give three doses daily—a large dose (75 mg) in the morning immediately on waking or rising, a moderate dose (5 mg) at noon and a small or moderate dose (25 mg) in the late afternoon. This dosage was gradually increased from week to week as the need arose, but the dosage was stopped well short of the point at which nervousness or nocturnal insomnia was produced. Ordinarily an increase of 5 mg weekly caused no untoward symptoms. All patients were supplied with only enough tablets to last until the next visit. No patient was given a prescription for the drug or was told its name. Tolerance to the drug, so far as its effect on the appetite was concerned, did not seem to develop, for substitution of placebo tablets or omission of the drug always caused a return of increased appetite, even after months of administration. The drug was found also to be of equal benefit in cases of obesity without any obvious neurotic background, such as a case associated with narcolepsy and several cases associated with endocrine stigmas. The patients were observed over periods of from six to twenty-three weeks with a total loss of weight of from 0 to 54 pounds (24.5 Kg).

### New Jersey Medical Society Journal, Trenton

35 166 (Jan.) 1938

- Colloidal Thorium in Radiologic Practice R Pomeranz Newark—p 7
- Conduct Disorders in Childhood L B Hohman Baltimore—p 10
- Selection of Treatment for Tuberculous Patient J B Amber on Jr New York—p 17
- Medical Aspects of Coma with Particular Reference to Respiratory Disturbances W H Lewis Jr New York—p 23
- A Historical Note on Coronary Thrombosis A E Parsonnet Newark—p 27
- The Heritage of Health W G Herrman Asbury Park—p 33

### Public Health Reports, Washington, D C

53 136 (Jan 7) 1938

- Studies on Chronic Brucellosis III Methods Used in Obtaining Cultures Mary A Poston—p 1
- Age of Gainful White and Negro Female Workers of the United States 1920 and 1930 Studies on Age of Gainful Workers Number Five W M Gafsafer—p 4
- Study of Variations in Reports on Hospital Facilities and Their Use J W Mountain E H Pennell and Emily Hankla—p 17



**Rocky Mountain Medical Journal, Denver**

35 188 (Jan.) 1938

- Interrelation of Hormones and Uterine Bleeding E C Sage Omaha —p 19
- Sulfanilamide in Treatment of Streptococcal Infections Good Effects and Bad Effects J J Waring and W A Rettberg Denver —p 26
- Detection and Treatment of Carbon Monoxide Poisoning R T Legge Berkeley Calif —p 34
- \*Rocky Mountain Spotted Fever with Reference to Recognition Prevention and Treatment G E Baker Casper Wyo —p 36
- Treatment of Osteomyelitis and Septicemia by Bacteriophage F H Albee New York —p 43
- The American Hospital Steps Ahead E A Van Steenkamp St Paul —p 47

**Rocky Mountain Spotted Fever**—In the treatment of tick fever, Baker resorts to symptomatic and supportive measures. Bed rest with hospital care has been enforced, together with the use of a soft, high carbohydrate diet during the early stages of the illness, increased to a light diet when adequate improvement has come about. Strained fruit juices are given in abundance and enemas are used as necessary. Medication has consisted of the use of 5 grains (0.3 Gm) of quinine sulfate, half a grain (0.03 Gm) of codeine sulfate and 5 grains of acetylsalicylic acid every four to five hours during the acute stages of the illness, together with the use of neoarsphenamine in metaphen given intravenously. The use of neoarsphenamine dissolved in metaphen, used intravenously, is not claimed in any way to be a specific, but clinical evidence has shown that the material has value. Their therapeutic action is not understood. Neoarsphenamine, 0.3 Gm, is dissolved in 10 cc of 1:1,000 solution of metaphen. The mixture is warmed and injected slowly into the median cubital vein, twenty minutes being taken to administer it. Blood is alternately withdrawn into the syringe and the material slowly injected until the entire amount has been given. The injections are given the first thing in the morning, the patient receiving no breakfast, at intervals of from three to five days during the acute stages of the illness. The use of the combination of the two drugs appears to affect favorably the course of tick fever. Patients show less toxemia, the eruption tends to remain discrete, renal and myocardial complications do not occur and the disease process itself is shortened. Convalescence is shorter, as a rule, and no complications have occurred. None of them had ever received prophylactic immunizations of tick vaccine.

**Southern Medical Journal, Birmingham, Ala**

31 1126 (Jan.) 1938 Partial Index

- Undulant Fever Comparative Value of Certain Diagnostic Tests A E Keller C Pharris and W H Gaub Nashville Tenn —p 1
- \*Accidental Discovery of Symptomatic Nonmanifest Pulmonary Tuberculosis C H Cocke Asheville N C —p 7
- Protamine Insulin in Treatment of Juvenile Diabetes Priscilla White Boston —p 15
- Early Results in Cervix Carcinoma from Single and Divided Doses of Roentgen Radiation A N Arneson St Louis —p 21
- \*Sarcoidosis Report of Case W B Blanton Richmond Va —p 26
- Role of Liver Damage in Mortality of Surgical Diseases F F Boyce and Elizabeth M McFetridge New Orleans —p 35
- Influence of Race on Proctology in the South C Rosser Dallas Texas —p 52
- The Management of Arteriosclerotic Disease of Lower Extremities J R Veal New Orleans —p 54
- Eye Changes in the Management of Hypertensive Toxemia of Pregnancy A Five Year Study A V Hallum Atlanta Ga —p 64
- Follow Up Study of Thirty One Cases of Acute Urinary Infection in Female Children L R Wharton Baltimore and L A Gray Louisville Ky —p 68
- Poliomyelitis Clinical Observations at Memphis During 1936 1937 C J Levy Memphis Tenn —p 71
- Cerebrospinal Meningitis in Flood Refugee Center W DeKleine Washington D C and W P Scarlett Little Rock Ark —p 75
- Study of Blood Magnesium in Allergic Individuals A H Braden and A H Braden Jr Houston Texas —p 85

**Symptomatic Pulmonary Tuberculosis**—Extensive tuberculosis, not yet manifested in symptoms, is being so frequently uncovered by roentgenography that Cocke maintains that no physical examination is complete without its use. One of the most striking paradoxes of tuberculosis is the absence of parallelism between symptoms, signs and x-ray evidence of disease. It is common to find symptoms without demonstrable physical signs but with definite x-ray evidence. There may be absence of both symptoms and signs, and yet the roentgenogram

may reveal sufficiently definite (active) disease to make the diagnosis clear. Again, though more rarely, the roentgenogram may seem apparently clear, though symptoms and signs are unequivocal. This type the author assumes has a pathologic condition of such similar density to lung and other structures of the chest that it fails to register on the roentgenogram to the point of recognition. Of the ten cases that he cites only one patient admitted any appreciable loss of weight, only one complained of a cough, only four gave a history of temperature, only one gave a history of an attack of pleurisy, only one complained of increasing fatigue and mild digestive symptoms and only one at first reported sputum (but six were found to have acid rods in the sputum). With the possible exception of the young man who expectorated a little blood, there was no history in any of the patients which might seem to point expressly to tuberculosis. The roentgenogram, however, in every instance was definitely positive for tuberculosis, four cases presenting definite cavitation not demonstrable by physical examination.

**Sarcoidosis**—Blanton cites a case of sarcoidosis that differs from the usual description of sarcoidosis in the following aspects: 1 The lesions of the bone, while typical of the disease in their appearance, are predominantly in the carpal and metacarpal bones, whereas in the average case the phalanges are involved more extensively. 2 The complicating arthritis, a condition under which the disease has masqueraded since the first appearance of symptoms four years ago, shows extensions of its pathologic process from bone to joint structures. 3 The microscopic appearance of the lymph node removed from the axilla shows that the nests of epithelioid cells are smaller and less prominent than those usually encountered and the enlargement of the follicles with hyperplasia of the nodes suggests earlier changes than have been observed heretofore. 4 Cutaneous lesions are absent. This uncommon circumstance emphasizes the importance of not excluding this disease from the field of general medicine, in which, by virtue of its protean manifestations, it appears to belong.

**Surgery, Gynecology and Obstetrics, Chicago**

66 1128 (Jan.) 1938

- Hurthle Cell Tumor of Thyroid Gland A O Wilensky and P A Kaufman New York —p 1
- Congenital Anomalies of Rectum and Anus J K Berman Indianapolis —p 11
- \*Use of Os Purum in Bone Implantations with Especial Reference to Its Use in Tuberculous Bone and Joint Lesions S Orell Stockholm Sweden —p 23
- Diabetes and Pregnancy W W Herrick and A J B Tillman New York —p 37
- Upper Pelvic Floor and Its Importance in Total Abdominal Hysterectomy Lilian K P Farrar New York —p 44
- Biologic Surgery in Tuberculous Patients C R Lavalle Buenos Aires Argentina —p 55
- \*Thrombophlebitis of Appendical Vein Complicating Acute Appendicitis S Z Hawkes Newark N J —p 62
- Conservative Treatment of Gallbladder Disease H E Mock C F G Brown and R E Dolkart Chicago —p 79
- Interposition Operation with Sterilization F I Harris San Francisco —p 88
- Hallux Valgus W I Galland and H Jordan New York —p 95
- Instrumental Dilatation of Papilla of Vater Experimental and Clinical Observations R Zollinger C D Branch and O T Bailey Boston —p 100
- Conduction Analgesia in Anorectal Surgery H E Bacon Philadelphia —p 105
- Treatment of Fistulas of Small Intestine J B Hartzell Detroit —p 108
- Uterus Bicornis Duplex Associated with Infection Due to Micro Aerophilic Hemolytic Streptococcus E B Self and F L Meloney New York —p 117

**Bone Implantations**—In implantation of bone in the skeleton one should use bone in such form and manner that the skeletal connective tissue in it can quickly revive and that the living skeletal connective tissue in the compact bone in the bed of the implant may grow into the canal system of the implant as easily and as quickly as possible. To fulfil the first qualification, fresh autoplasmic bone is ideal, to fulfil the second, bone which Orell has called "os purum," and which is prepared in a special manner is nearest ideal. Ordinary bone is freed as completely as possible of connective tissue, fat and protein foreign to the host, and the calcified substance made as clean as possible without injuring its mechanical strength. The method of preparation consists chiefly of the removal of the blood proteins by soaking in saline solution, the connective

tissue by soaking in warm potassium hydroxide and the fat by soaking in acetone. The author has used the implantation of os purum in forty-nine cases to replace bone. It has been used to fill up the bone defects which result from operation, to lessen the chance of producing deformities and to fix the parts of the skeleton in proper relation to one another in various ways often after replacing, reshaping or changing their position. Many of the patients with implants of os purum have now been observed for four or five years. The wounds have, as a rule, healed without complications and the implants have shown sufficient strength for their mechanical task until they have gradually been rebuilt and replaced by new bone. Implantation of os purum should be preferably done in cases of bone tuberculosis when the disease is in a quiescent stage and when the lesions have shown some tendency toward localization. Even in many cases of joint resection in more active forms of tuberculosis os purum may give a good result. It is only in cases in which fistulas have formed or in cases in which the overlying skin has been rendered thin and unhealthy by secondary infection or abscess formation that the implant is sometimes extruded. In using os purum, an especially careful aseptic technic is demanded. A good clinical result from the implantation of os purum may be expected only when skeletal connective tissue is present in the bed of implantation. In implants into the epiphysis, large surfaces of cancellous bone must lie against the os purum, in implants into the diaphysis, living periosteum as well as compact bone must surround it.

**Thrombophlebitis of Appendical Vein**—Hawkes declares that one of the factors which contribute to the high mortality rate of appendicitis is failure, in some cases, to recognize thrombophlebitis of the appendical vein. This complication so alters the diagnostic, pathologic, prognostic and therapeutic features that there may be justification for placing appendicitis, thus complicated, in a category of its own. A survey of this type of appendicitis is attempted, together with the operative treatment thus far practiced. The occurrence of a chill and typical symptoms of acute appendicitis point to a complicating thrombophlebitis of the appendical vein. The treatment consists in ligation of the ileocolic vein above the thrombus before appendectomy is performed. Unless the condition is treated early and the ileocolic vein ligated, emboli may occur, causing either pyelophlebitis or liver abscesses. Early recognition and proper treatment of this type of appendicitis may contribute to lowering the mortality rate of appendicitis as a whole.

### United States Naval Med Bulletin, Washington, D C

36 1 162 (Jan) 1938

- Diabetes and Protamine Insulin E P Joslin—p 1  
Compressed Air Illness C W Shilling—p 9  
Treatment of Hay Fever with Alum Precipitated Pollen Extract R F Sledge—p 18  
Malaria W H Michael—p 29  
Barbiturate Poisoning Review with Report of Two Cases F L McDaniel and R A Bell—p 32  
Carbamide Poisoning J D Blackwood Jr and E B Erskine—p 44  
Sulfanilamide Therapy of Gonorrhea R H Snowden and R A Bell—p 45  
\*Sulfanilamide Treatment of Ludwig's Angina J E Fulghum—p 58  
Psychosis Precipitated by Sulfanilamide B W Hogan and P J McNamara—p 60  
Sulfanilamide Poisoning Report of Fatal Case J T O Connell—p 61  
Results of Sulfanilamide Therapy of Gonorrhea E R Hering—p 63  
Chondrodystrophy Fetals W S Sargent—p 67  
The Cancer Problem in the United States Navy O B Spalding—p 74  
Carcinoma of Lung I J Warmolts—p 79  
Bronchogenic Carcinoma Metastases to Heart and Pituitary Case Report I L Norman and W M Silliphant—p 89

**Sulfanilamide in Treatment of Ludwig's Angina**—Fulghum administered sulfanilamide intramuscularly to a child, aged 3 years, who had Ludwig's angina resulting from streptococci entering from a lesion on the chin. The progress of the disease was arrested and there was a gradual regression of swelling without formation of pus and with rapid return to normal as compared to the usual surgical treatment. Although only one case is reported, the author feels that sulfanilamide is a valuable drug in the treatment of Ludwig's angina due to streptococci and that by its use the mortality rate of Ludwig's angina will be decreased greatly.

### FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Dermatology and Syphilis, London

50 1 58 (Jan) 1938

- Psychologic Aspects of Skin Diseases R D Gillespie—p 1  
Cutaneous and Subcutaneous Leishmaniasis R B Evans—p 1  
Pseudo Atrophoderma Colli L Goldman and E B Tauber—p 22  
Dupuytren's Contraction Camptodactylia and Knuckle Pads Note F P Weber—p 26

### British Journal of Ophthalmology, London

22 1 64 (Jan) 1938

- Congenital Vascular Veils in Vitreous Ida Mann and A Macrae—p 1  
Intra Ocular Neuroma (von Recklinghausen's Disease) of Left Optic Nerve Head Case H B Stallard—p 11  
Significance of Heredity in Ophthalmology Preliminary Survey of Hereditary Eye Diseases in Tasmania J B Hamilton—p 19  
Use of Contact Glass for Cosmetic Purpose S K Mukerjee—p 43  
Stenopeic Spectacles A L Young—p 45

### British Medical Journal, London

2 1261 1310 (Dec 25) 1937

- Tuberculosis in Hospital Workers P W Edwards—p 1261  
Vinyl Ether as an Anesthetic Agent V Goldman—p 1265  
Anesthesia in Minor Surgery J H T Chailis—p 1269  
\*Visceral Pain J Morley—p 1270  
Brucellosis in Man and Animals in Staffordshire Laboratory Observations J Menton—p 1273

**Visceral Pain**—Morley limits his remarks to the mechanism of visceral pain and for the most part with pain originating in the gastro-intestinal tract. The one stimulus adequate to produce direct visceral pain in the gastro-intestinal tract appears to be tension on the afferent nerves in its muscular coats, and this tension is usually caused by spasmodic and exaggerated peristaltic contraction. The sensitive mesentery is often involved in such lesions as strangulation and volvulus, and this causes a combination of visceral and somatic pain that is not easy to unravel. The nerves of the sensitive parietal peritoneum must receive the stimulus that gives rise to the pain and tenderness in the superficial parts of the abdominal wall and to the associated reflex muscular rigidity. The process is described as peritoneocutaneous radiation and a peritoneomuscular reflex. An appreciation of this peritoneocutaneous radiation is essential for any true understanding of abdominal pain, and the mechanism is best illustrated by stimulation of the phrenic nerve terminals below the diaphragm. When the undersurface of the central portion of the diaphragm receives a painful stimulus, immediate pain is felt in the region of the descending branches of the third and fourth cervical nerves supplying the skin of the supra-acromial region. Infiltration with procaine hydrochloride of the area of skin supplied by the third, fourth and fifth cervical nerves either abolishes or greatly modifies the referred pain caused by stimulation of the diaphragm. A study of phrenic pain leads to the conclusion that a precisely similar peritoneocutaneous radiation occurs in the superficial nerves of the anterior abdominal wall when the underlying parietal peritoneum receives a painful stimulus from an inflamed viscus or inflammatory exudate. The localizing pain in acute appendicitis or acute cholecystitis is greatly modified or completely abolished by inducing local anesthesia by subcutaneous infiltration of the area in which the pain is felt. Whatever the ultimate truth may be as to the mechanism of referred pain in angina the author contends that it differs fundamentally from the mechanism of pain in the gastro-intestinal tract, in which there certainly is a dual mechanism. On the one hand, one sees true visceral pain as part of a defense against the threat of obstruction. It is primitive in the scale of evolution, is in no sense referred to the superficial somatic nerves and is imperfectly and vaguely localized. On the other hand, one finds referred pain, the stimulus for which arises not from the visceral afferent nerves at all but from the somatic nerves of the parietal peritoneum. It has been evolved as a protection against bacterial infection of the peritoneum, either by penetrating wounds from without or by perforation of the intestine within. It is later in the scale of evolution and produces a radiation of pain to the superficial somatic nerves and a reflex protective rigidity of the overlying muscles, both of which are localized accurately

# Edinburgh Medical Journal

45 172 (Jan) 1938

- Chronic Nutritional Hypochromic Anemia L S P Davidson and H W Fullerton—p 1  
Clinical Recollections and Reflections \ \ Some Observations on Notifiable Streptococcal Infections W T Benson—p 24  
Debatable Tumors in Human and Animal Pathology III Seminoma J R M Innes W F Harvey and E K Dawson—p 36  
Neuropsychologic Basis of Conduct Disorder R G Gordon—p 43

# Glasgow Medical Journal

10 245 292 (Dec) 1937

- Optic Neuritis (Retrobulbar and Papillary) L Paton—p 245

# Journal of Hygiene, London

38 1 128 (Jan) 1938

- Investigation of Factors Governing Potato Starch Refection in Rats P M Kon S K Kon and A T R Mattick—p 1  
Experiment on Nutritive Value of Winter Produced Summer Milk J C Drummond Eleanor Singer S J Watson W S Ferguson and M S Bartlett—p 25  
Influence of Growing Family on Diet in Urban and Rural Districts F Brockington—p 40  
\*Mechanism of Malaria Transmission in the Province of North Holland N H Swellengrebel, A de Buck and H Kraan—p 62  
Incidence of Organisms of Salmonella Group in Wild Rats and Mice in Liverpool A M Khalil—p 75  
Disease Resembling Distemper Epidemic Among Ferrets E T C Spooner—p 79  
Investigation into Cancer Mortality Among Males in Certain Sheffield Trades H M Turner and H G Grace—p 90  
\*Intradermal Test in Whooping Cough Review with Study of 1300 Cases A R Thompson—p 104  
Keeping Qualities of Vaccine Lymph G G Butler—p 120

**Mechanism of Malaria Transmission**—Swellengrebel and his co workers state that the rate of malarial infection in nature is more than a hundred times higher in *Anopheles maculipennis atroparvus* than in *Anopheles maculipennis messeae*. The periodicity of anopheline malaria is the effect of the periodically recurring intermissions in the fertility of *Anopheles maculipennis atroparvus*, associated with continued blood feeding. These intermissions occur independently of temperature. *Anopheles* can become infected at least as late as October 7. An infection acquired at that time takes no more than three weeks to reach the salivary glands. Winter contributes to the shaping of the epidemiology of malaria in Holland by causing the sporozoites to degenerate. *Anopheles* spread the malaria parasites from man to man and from house to house in the autumn. Man keeps them alive till the next transmitting season. Man spreads malaria from village to village. Anopheline malaria dies out in a house by the deterioration of the human parasite reservoir or by the lack of *Anopheles*, resulting from the removal of appropriate places for *Anopheles* to hide in. But it can also become extinct because human parasite carriers lose their infectivity before they get rid of their parasites. The failure of infected *Anopheles*, staying in a house, to cause malaria in the human inmates of that house during the next year is due to a partial immunity or to an unusually long period of incubation of the human host. The incidence of human malaria is highest near the foci of anopheline malaria of the preceding year. The scattered cases of malaria (one patient houses) do not all conform to this rule. Their distribution suggests that a certain number (less than one fifth) of the malaria houses are infected by *Anopheles* carrying sporozoites during the period of their sexual activity in the second half of July and the first half of August.

**Intradermal Test in Whooping Cough**—The conflicting views of investigators prompted Thompson to observe the intradermal reaction in a comprehensive series of cases and suggested that as far as *Haemophilus pertussis* was concerned any cutaneous response would be allergic in nature, as distinct from the toxin antitoxin reactions elaborated in the Schick and Dick tests. Comparative tests were therefore performed on a total of 1300 subjects, 1,182 of whom were less than 10 years of age and 300 of whom were suffering from pertussis. The observations do not support the claim that the intradermal response to Sauer's vaccine in the strength commonly employed (10,000 million organisms per cubic centimeter) is of value either in demonstrating immunity to whooping cough or in its early diagnosis. The bacterial content of this vaccine appears to be too high for purposes of skin testing giving rise to inflam-

matory lesions of a nonspecific character rather than to allergic reactions of specific value. These reactions are less apparent when the vaccine is employed in a diluted form. The intradermal response to pertussis endotoxin, on the other hand, though not invariably consisting of a clear-cut reaction, is more consistent with the development of the allergic state toward *Haemophilus pertussis*, reactions presumably of this nature being present in the skin of approximately 85 per cent of children with a past history of whooping cough. Similar reactions, however, can be elicited in the skin of about 30 per cent of the subjects with no history of the disease, but in view of the fact that, unlike the more invasive virus diseases, many persons never develop whooping cough in spite of almost certain exposure when young, it is suggested that latent immunization or recent contact with the causative organism might account for this phenomenon. The onset of bacterial hypersensitiveness, as judged by the pertussis endotoxin test, appears about the tenth day of whooping cough and becomes heightened during the subsequent course of the disease. Ultimately this cutaneous allergy undergoes a regression, which, however, is not always complete. For this reason the pertussis endotoxin test would appear to be of some value in assessing the immune state of the individual, and also as a diagnostic reaction in early, atypical or late cases of whooping cough in which bacteriologic observations by the cough plate method have proved disappointing.

# Journal of Laryngology and Otology, London

52 803 890 (Dec) 1937

- \*Subglottic Cancer of Larynx St Clair Thomson—p 803  
Bilateral Ossification of Stylohyoid Ligament Combined with Cervical Exostoses J B Cavenaugh—p 817

**Subglottic Cancer of Larynx**—Sixteen years ago St Clair Thomson, when studying the most usual site for intrinsic cancer of the larynx, found that in fifty consecutive cases there were thirteen in which the subglottic region was involved. The usual intrinsic cancer originates on the upper surface or on the free margin of a cord. A subglottic neoplasm may also take its origin on the inner or lower surface of the cord, but below its free edge, which then remains intact until the growth extends up to it from below. Until this occurs the voice may not be affected and the symptoms may be trifling. The typical subglottic cancer arises in the area below and distinct from the cord, sometimes as low as the cricoid ring. As the neoplasm grows it tends to extend upward until, when advanced, it appears on the edge of the cord. But a subglottic growth may even run its course without ever extending to a cord. In the subglottic group, alteration of voice is not the first or an early noticeable symptom. The patient may first complain of occasional "colds in the throat" and at times may feel the voice veiled and find difficulty in shifting any catarrh from the larynx. The gradual onset of slight dyspnea and stridor on exertion—two indications much neglected both by the public and by the profession—may first bring the case to a laryngologist, who may fail to detect anything serious in the early stages or may notice only occasional or even variable paresis of one cord. Many patients do not seek advice until the neoplasm has reached the edge of the cord and begins to cause hoarseness. When a cord is clear or only congested, or when the margin is simply serrated at one point and particularly when the movement is at all impaired, careful inspection may reveal a subglottic growth. A subglottic cancer may occur in early life and even when grown to a considerable size the correct diagnosis may be overlooked by a whole group of experts. When an unsuspected subglottic growth extends upward until it reaches the free edge of the cord it may produce a "mouse nibbled" ulceration and its first appearance may simulate a tuberculous lesion. A biopsy would be of help in these cases, if a satisfactory specimen could be obtained. Recent improvements in x-ray technic give promise of being helpful in determining the full extent of a subglottic cancer. The prognosis in all cases of subglottic cancer is much less hopeful than in intrinsic cases limited to the free edge or surface of the cord. Of the thirteen patients with subglottic disease seven have died of recurrence. Again, impaired mobility of a cord is encountered more frequently in subglottic cases and is of evil augury. Thus, of twenty-seven patients with a mobile cord, twenty-one were alive and free from local recurrence three years later, while

of seventeen with impaired movement only seven were alive and free from recurrence. In the thirteen cases of subglottic cancer the cord was fixed in no less than six cases. It is difficult to decide when subglottic cases might be adequately dealt with through a laryngofissure, and when a more extensive operation (generally a complete laryngectomy) is necessary. If the subglottic growth has not reached the arytenoid region or spread as low as the cricoid cartilage and has not invaded the anterior commissure or crossed to the other side, removal by the laryngofissure route can be quite successful in securing a lasting cure, even if impaired mobility of the cord is noted. Even fixation of the cord, although it diminishes, does not destroy the possibility of lasting cure by a laryngofissure. Although not nearly so promising, even a bilateral subglottic cancer, if it has not invaded the actual anterior commissure, can be successfully treated through a laryngofissure. Invasion of the anterior commissure itself often means spread of the disease through the cricothyroid membrane into the soft tissues of the neck. In such cases the probability of a successful result, even by a complete laryngectomy, is diminished.

### Journal of Mental Science, London

83 609 752 (Nov.) 1937

- \*Convulsion Therapy in Schizophrenia A Kennedy —p 609
- Unusual Complication of Insulin Shock (Hypoglycemic) Therapy C B Molony and M S Honan —p 630
- Value of Continuous Narcosis in Treatment of Mental Disorder H A Palmer —p 636
- Epileptic Reactions Attempt at Classification A Guiradham —p 679
- Treatment of Epilepsy with Psychosis by Prominal D E Sands —703
- Familial Psychoses Associated with Endocrine Disorder T A Munro —p 707
- Profound Dissociation of Personality Case C L Copeland and E H Kitching —p 719

**Convulsion Therapy in Schizophrenia**—Kennedy gives an account of his experience of convulsion treatment of schizophrenia, reviews the literature and reports three cases recently treated at West Park Hospital. More than 1,000 cases have now been treated at various hospitals in Europe, and the mortality and remission rates, especially in the catatonic type of case, compare favorably with the insulin shock treatment. The permanence of the remissions produced by this method cannot as yet be assessed. Discussion as to the type of schizophrenia which reacts most favorably to convulsion therapy has been ambiguous, owing to the differing ways of describing clinical syndromes, but there is little doubt that in the classification of Kraepelin the catatonic form reacts best and the paranoid is least affected, in contrast to the results of insulin treatment. Recently, while giving insulin shock treatment to six patients, Molony and Honan found that one patient on the twenty-second day of treatment did not awake from the hypoglycemic coma on being given food. Intravenous dextrose and epinephrine also failed to revive her. Blood and spinal fluid sugars were then found to be excessive and antidiabetic treatment (including insulin) was administered with success.

### Lancet, London

1 164 (Jan 1) 1938

- Surgical Treatment of Angina Pectoris and Allied Conditions D T Davies H E Mansell and L O Shaughnessy with cooperation of Dawson —p 1
- \*New Syndrome Apparently Due to Overactivity of Posterior Pituitary E I Jones —p 11
- \*Clinical Hyperfunction of Posterior Lobe of Pituitary Suggested by a Pressor and Antidiuretic Substance Obtained from Urine R L Noble H Rinderknecht and P C Williams —p 13
- \*Electrosurgical Obliteration of Gallbladder Without Drainage Report of 342 Cases M Thorek —p 15
- \*Vitamin C Output in Diet Treatment of Rheumatoid Arthritis D C Hare and E C P Williams —p 20
- Prevalence of Sonne Enteritis L H D Thornton and E M Darmady —p 25

**Overactivity of Posterior Pituitary**—For eight months Jones has observed a patient who presented a combination of hypertension, hyperchromic anemia, achlorhydria and abnormal carbohydrate tolerance. An extract of the patient's urine contained a substance or substances which had the actions of solution of posterior pituitary and the clinical observations suggest that there is hyperfunction of the posterior lobe of the pituitary. The fact that, as his condition improved, the amount of pituitary-like substance excreted in the urine diminished indicates that

the hyperfunction is either an isolated occurrence or is possibly cyclic in nature. Continued observation of the patient will settle this point. The syndrome described is thought to be new to clinical medicine, but the diseases that are known to affect the anterior lobe of the pituitary and other ductless glands lead one to believe that the hyperfunction of the posterior pituitary is at least theoretically possible.

**Hyperfunction of Posterior Lobe of Pituitary**—The similarity between the condition of the patient in the preceding abstract and that which could be produced in animals suggested to Noble and his collaborators that it would be of interest to determine whether the vasopressor principle could be obtained from the patient's blood or urine. Specimens of blood and urine were collected in May and July. An extract containing pressor and antidiuretic activity has been obtained from the urine, suggesting hyperfunction of the posterior pituitary. The effects of this extract are similar to those produced by the pressor principle of pituitary preparations.

**Electrosurgical Obliteration of Gallbladder**—Thorek felt that, if a dry, nonleaking surface could be substituted for the discharging cavity represented by the bed of the gallbladder resulting from classic cholecystectomy, it would be an important step. Experimental studies on dogs and monkeys proved that this can be accomplished by proper electrocoagulation. The tendency of electrocoagulated surfaces to become agglutinated with serous surfaces requires putting into service the falciform ligament. So far (August 1937) 342 operations have been performed by this method in cases of gallbladder disease including gangrene, empyema and sclerosis. There were three deaths in the series. One patient succumbed to an undiagnosed chronic subdiaphragmatic abscess some time after operation. Another patient died from massive bilateral pulmonary collapse and the third from pneumonia about three weeks after the operation. Failures and fatalities in classic cholecystectomy are often due to bile leakage, as a result of an inability to obliterate and cover the bed of the gallbladder, and drains invite bile seepage. With this method a prerequisite to satisfactory results is a patent common duct. An occluded cystic duct from any cause is an indication for this operation. The operation effectually accomplishes destruction of the entire thickness of the wall of the gallbladder and, if indicated, also the bed of the gallbladder. The surgeon has under control the degree of penetration he wishes to accomplish. The ligamentum falciforme hepatis is used as a free graft, its serous structure covers sutured or raw surfaces to great advantage, thus reinforcing and protecting the areas concerned against seepage and safeguarding the processes of repair. Electrocoagulated areas of intra abdominal organs tend to heal by encapsulation. They do not interfere with wound healing. Therefore drainage is not only undesirable but is distinctly deleterious. Electrosurgical obliteration of the gallbladder exacts careful technic and meticulous attention to detail.

**Vitamin C Output in Diet Treatment of Rheumatoid Arthritis**—During the last eighteen months Hare and Williams have been studying the effects of a raw vegetable and fruit diet in six cases of rheumatoid arthritis with a view to determining the effective factor in the diet. In this the two most striking variants from an ordinary mixed diet were the abnormally high vitamin C and the abnormally low sodium chloride content. One patient could not be kept strictly to the diet. The other five patients showed definite clinical improvement.

### Medical Journal of Australia, Sydney

2 1019 1060 (Dec 11) 1937

- Peptic Ulcer Analysis of 218 Cases Studied at Autopsy R J Warr-Smith —p 1027
- Bleeding Peptic Ulcer I J Wood —p 1031
- Artificial Hatching of Taenia Saginata Ova W J Penfold H B Penfold and Mary Phillips —p 1039

2 1061 1106 (Dec 18) 1937

- \*Substances Controlling Growth of Implanted Tumors W Moppett —p 1065
- Acrocyanosis C G Lambie and S M Morson —p 1070

**Substances Controlling Growth of Implanted Tumors**—Moppett agrees with the conclusions of other workers that extracts of the anterior pituitary containing both growth and gonadotropic hormones appear to stimulate the growth of an

implanted tumor and that thyroxine may in certain circumstances retard the growth of implanted tumors. One can regard a tumor as in some respects a dedifferentiation. In the early embryo differentiation is believed to result, partly at any rate, from certain definite chemical molecules termed organizers. In certain amphibian embryos a second neural canal can be brought about by certain other soluble substances which are probably related to cholesterol and to the cancer producing molecules. One would expect an organizer to retard tumor growth by causing differentiation of the tumor cells, and thyroxine may be considered in this class of substance in virtue of its action on amphibian metamorphosis. There is thus a prospect of controlling cancer growth by administration of organizers. One would not expect success in every case with a given substance, since organizer action depends on "competence" of a given tissue to respond. Nevertheless, if thyroxamine or a more potent derivative, or some of the cholesterol derivatives, would control any recognizable tumor, a new era in cancer treatment would be introduced.

### Practitioner, London

139 633 736 (Dec) 1937

- Development of Chemotherapy for Bacterial Diseases H Hoerlein — p 635  
\*Assessment of Efficiency of Chemotherapeutic Substances L E H Whitby — p 650  
Use of Antistreptococcus Preparations in General Practice A H Douthwaite — p 661  
Use of Antistreptococcus Preparations in Obstetrics A C Bell — p 673  
Nomenclature and Dosage of New Antistreptococcus Preparations W K Fitch — p 680  
Acute Pulmonary Edema Its Pathogenesis and Treatment M Campbell — p 689  
Environment in Treatment of Psychoneuroses Grace Nicolle — p 696  
Stammering Habit Correction Through Speech Reeducation H St J Rumsey — p 707  
Diet in Health and Disease VI Diet in Gastric Diseases M E Shaw — p 715

**Efficiency of Chemotherapeutic Substances** — Whitby shows what sound evidence there is for believing the sulfanilamide compounds to be effective, how such evidence has been collected and suggests how further evidence may be accumulated. The investigation of hemolytic streptococcus infections in mice has presented relatively few difficulties. Results have been consistent. The meningococcus has presented more difficulty, but the results have been sufficiently convincing to warrant the use of sulfanilamide in the human subject. With the pneumococcus the experiments have been irregular and unconvincing, there is no sound experimental work to suggest that sulfanilamide has any marked action in pneumococcal infections, and thus despite the fact that mice are readily susceptible to infection so that a clear-cut result, a reduction in mortality rate, could be obtained if sulfanilamide were really effective. *Bacillus coli* and *Streptococcus viridans* cannot be satisfactorily investigated in an experimental animal. There is a considerable breach to be filled between proving the efficiency of a drug in an animal and the use of the same drug in the human subject. The ideal assessment is made with a group of treated patients compared with an equal group of untreated controls. Were one of the medical journals to undertake the proper collation of information from general practitioners concerning their experience with definite remedies, valuable deductions could be made. The reports concerning puerperal sepsis have been models of discretion. It is justifiable, however, to use it whenever there is sound reason to anticipate puerperal sepsis, for example, in any case in which delivery is effected with much instrumental intervention or in suggestive circumstances. The treatment of erysipelas with sulfanilamide has been uniformly successful. As streptococcal meningitis has ordinarily a mortality of about 100 per cent, one cannot but be impressed with the reports of successful treatment in individual cases. Sulfanilamide appears rapidly in the cerebrospinal fluid and, experimentally, the drug is known to have an effect on meningococci. The value of sulfanilamide in gonorrhea is in the process of being properly assessed. Experimentally the drug is apparently effective against the gonococcus and there is every reason to suppose that it will benefit gonorrhea because the compound is not only excreted in the urine but is also more important, present in blood serum and tissue fluids. The use of sulfanilamide in *Bacillus coli* infections of the urinary tract was first advocated by Huber (1936), who obtained striking results in

the pyelitis of children. There is good evidence that the drug is effective in these infections. It has not yet been shown whether or not the relapse rate is less after sulfanilamide than after other modern forms of treatment. Clinical successes have been claimed for the treatment of pneumococcal infections as well as gas gangrene. There is not yet sufficient evidence to show whether or not these claims are justified. The drug will tend to be discredited if used irrationally. The therapy is not without danger. Possible complications now include sulfhemoglobinemia and methemoglobinemia, as well as acute hemolytic anemia, agranulocytosis, drug fever, cutaneous eruptions, including purpura and optic neuritis. Because the drug has toxic properties it is preferable to prescribe it for those who are at rest in bed and who are under daily observation, not for those who are ambulant.

### Archives de Médecine des Enfants, Paris

41 1 64 (Jan) 1938

- Leucosuria in Child Study of Rare Disorder of Carbohydrate Metabolism G Pisseau J Ferroux and A Mangeot — p 5  
Treatment of Interstitial Keratitis in Course of Congenital Syphilis E Lesne and D Ronget — p 11  
\*Time of Appearance of Meningitis in Course of Tuberculous Infection P Nobecourt and S-B Briskas — p 17  
Perihilar and Periscissural Images with Chronic Nonbacterial Evolution in Children F Tissot — p 26  
\*Administration of Globulins of Placenta in Some Infectious Diseases of Children O Felsenfeld — p 30

**Meningitis in Course of Tuberculous Infection** — Nobecourt and Briskas investigated the time of appearance of meningitis in the course of tuberculous infection in children up to the age of 15 years. The material on which their investigations were made is the following: 1. There were 344 cases of tuberculous meningitis that were observed during the fifteen years between 1921 and 1935 inclusive, among a total number of 13,331 children, who were admitted to the children's clinic during that time, this represents an incidence of 2.5 per cent. 2. There were twenty-four cases of tuberculous meningitis observed during the year 1936 among 1,645 children, which represents an incidence of 1.4 per cent. The total of 368 cases of tuberculous meningitis observed among 14,976 hospitalized children represents an incidence of 2.4 per cent. The authors first take up the twenty-four cases that were observed during 1936. Classification according to the months in which the tuberculous meningitis developed reveals that the frequency is greatest during April, July, August and September. The same frequency was observed from 1921 to 1935. In taking up the time of appearance of the tuberculous infection, the authors show that this encounters considerable difficulties, particularly in older children. They cite several case histories. The first one reported concerns a nursing who, at 7 months, gave negative cutaneous reactions for tuberculosis and at 10 months the nursing died as the result of tuberculous meningitis. In the second child whose history is reported, the interval between the last negative cutaneous reaction and the appearance of the tuberculous meningitis was eight months. The authors further present an analysis of the time of appearance of the tuberculous infection in twenty-seven nurslings aged from 2 to 10 months. In twenty of these the meningitis appeared from one to three months and in seven from three to six months after the tuberculous contact. In the last part of their discussion the authors present a review of the literature on this subject. On the basis of this review and of their own observations they conclude that the interval between the beginning of the tuberculous infection and the clinical manifestations of the tuberculous meningitis varies between three and six weeks on the one hand and between three and six months on the other hand. As a rule the meningitis appears during the primary phases of the tuberculous infection, it is a manifestation of the primary-secondary period. Rarely tuberculous meningitis develops after a more or less old form of the tuberculous infection if the latter has caused lesions in various organs. Occasionally, tuberculous meningitis develops in children in whom the first infection is apparently cured and is due either to a reactivation or to a new infection.

**Use of Globulins of Placenta in Infectious Diseases** — Felsenfeld points out that although convalescent serum can be used with success in a number of diseases, the supply is not always sufficient. Therefore the use of serum of the placenta

for the prophylaxis and treatment of infectious diseases was favorably received. The author describes the protective measures employed against contagious diseases in the Institute for Tuberculous Children, with which he is connected. He points out that the globulins of the placenta, administered as soon as possible and immediately after contact with the agent of infection, protect a large percentage of children against measles and scarlet fever but are not efficacious against rubella. In the therapy of measles, scarlet fever and epidemic parotitis, the immunizing globulins produce favorable results.

### Presse Medicale, Paris

46 153 168 (Jan 29) 1938

- \*Roentgen Therapy of Second Lumbar Sympathetic Ganglion in Coxarthrosis—Duhem, Moro and Montmignaut—p 153
- Cardiovascular Tonics Used in Urgent Cases—P Oury, H Besson and H Bouchara—p 154
- Evolutionary Phases of Pulmonary Tuberculosis—M Jaquerod—p 157

**Roentgen Therapy of Sympathetic Ganglion in Coxarthrosis**—Duhem and his associates point out that many authors have recommended the application of roentgen rays to the diseased joints. It was found that these roentgenologically visible lesions were not influenced by the irradiations and yet the joint became more supple and the pains diminished or disappeared. The authors suggest that the sympathetic probably plays an important part in the genesis of the pains that accompany coxarthrosis. They direct attention to Leriche's work on ramisection, ganglionectomy and sympathectomy as well as to the method that employs anesthetic infiltration of the sympathetic. The authors had the idea to employ, instead of this anesthetic infiltration, roentgen irradiation of the second lumbar ganglion in patients who had arthritis of the hip. They apply the rays to the spinal process of the second lumbar vertebra. The voltage employed is from 180 to 200 kilovolts. The intensity is 3 milliamperes, the filter consists of 0.5 mm of a heavy metal (copper for instance) and 2 mm of aluminum. The focal distance is 40 cm. The dosage must be sufficient, without being excessive. The authors usually employ 150 roentgens at each session, two of which are given each week. The total number of irradiations is generally six, so that 900 roentgens is applied in all. The authors employed the treatment in twenty-five cases. In a disorder as capricious as chronic arthritis of the hip it is difficult to estimate the efficacy of a treatment. Nevertheless, on the basis of results obtained with the roentgen irradiation of the second lumbar sympathetic ganglion they conclude that the treatment is without danger and that it reduces the pain and improves the walk of patients with coxarthrosis. In four of the cases in which this treatment was given amelioration was noticeable after the second or third irradiation, in six other cases after the fourth irradiation, in eight others after the sixth irradiation, and in the other cases the improvement did not become noticeable until two weeks after the irradiations, but the treatment never showed itself inefficacious. As yet they are unable to say whether the improvement will be lasting. In some cases the treatments had to be resumed at the end of a month. Moreover, a modification of the technic may be advisable.

### Arch p 1 Stud d Fisiopat e Clin d Ric, Siena

5 333 412 (Sept Oct) 1937

- \*Polypeptides in Blood in Typhoid—G Rettanni—p 333
- Hemoglobin in Chemical System Regulating the Reactions of Blood—L Antognetti—p 357
- Pathogenesis of Obesity in Relation to Secretory Activity of Hypophysis—L Antognetti and D Scopinaro—p 373
- \*Azotemia from Administration of Food Proteins—M Bassi—p 393

**Polypeptides in Blood in Typhoid**—Rettanni followed the behavior of the polypeptides in the blood of twenty-four patients who were suffering from typhoid. He found that they increase during the first week of the disease, reach the highest values in the second week, diminish by the third week and return to normal during convalescence. The index of cleavage (deamination) of the peptides, which shows dysfunction of the liver, parallels the variations of polypeptidemia. The increased amount of polypeptides in the blood which is induced by administering 40 Gm of peptone to the patients in the peak of the disease, lasts longer than in normal persons. The index of cleavage of peptides is also more prolonged after the test in

patients with typhoid than in normal persons. According to the author the increase of polypeptides in the blood, which is proportional to the seriousness of the disease, is due mainly to a dysfunction of the liver in deaminizing peptides. The dysfunction of the liver is also proportional to the seriousness of typhoid. An increased disintegration of proteins in the blood by fever is a secondary factor. The disturbances of the nervous system and of the cardiovascular apparatus in the course of the disease are caused by a double intoxication of the structures by polypeptides and typhoid toxins.

**Azotemia from Administration of Food Proteins**—Bassi found that the administration of 60 Gm of food proteins increases azotemia slightly in normal persons, moderately in patients with renal diseases with a moderate retention of nitrogen in the blood and intensely in patients with renal disease and hyperazotemia. The intensity and duration of the increased azotemia, which follows administration of food proteins, is not proportional in all cases to the values of azotemia during fasting and before the test. The curves of induced hyperazotemia are pathologic, showing insufficiency of the kidney in some renal diseases without hyperazotemia. The test of administration of food proteins is of diagnostic and prognostic value for insufficiency of the kidney. On the basis of the changes of azotemia induced by the test, the author states that food proteins administered in the diet are of advantage in renal diseases. A diet consisting only of milk diminishes the organic resistances and causes organic dystrophies and lesions of the kidneys, which are prevented and corrected by a well directed diet containing proteins.

### Clinica Medica Italiana, Turin

68 821 900 (Dec) 1937

- \*Hypotensive Action of Autohemotherapy—V Longo—p 825
- Clinical and Roentgen Study of Forms of Influenza Seen in Winter of 1936 1937—R Agnoli and A Vallebona—p 867

**Hypotensive Action of Autohemotherapy**—Longo reviews the literature on autohemotherapy in cerebral hemorrhage and arterial hypertension. He concludes that autohemotherapy is of value in the treatment of cerebral hemorrhage. The technic is easy and the treatment is harmless. It gives satisfactory results in a large number of cases of cerebral hemorrhage. Autohemotherapy gives the best results in arterial hypertension. A statistical review of about 250 cases reported in the literature, which includes work carried on by the author, shows that arterial hypertension is lowered by autohemotherapy in about 91 per cent of the cases in which the treatment is resorted to. The effects of autohemotherapy are not permanent. They last for a time which varies from six months to two years or more. If hypertension reappears the treatment can be repeated, as it is harmless and controls hypertension when ever it is administered. The author discusses the mechanism of action of autohemotherapy on arterial hypertension, which is controlled by the following factors: (1) a repeated hemoclastic shock induced by the injection of the patient's own blood, (2) the development of histamine and similar substances of hypotensive action at the point at which the blood is injected and the consequent entrance of the substances in the body and (3) phenomena of immunity. The latter take place by the entrance of autoproducts in the blood which transform themselves into heteroproteins, and of hypertensive substances which transform themselves into antibodies which neutralize the hypertensive substances present in the blood of the patients.

### Policlinico, Rome

45 1 60 (Jan 1) 1938 Medical Section

- Roentgen Aspects of Muscles in Some Myopathies—Primary and Neurogenic (Charcot-Marie) Types—G Meldolesi and U Garretto—p 1
- Angiotrophoneurosis—Cystic Adenoma of Thyroids with Scleroderma and Raynaud's Syndrome—Case—L Jacchia—p 16
- Pseudoblock of Cerebrospinal Fluid in Sacrolumbar Malacic Acute Hematomyelitis—D Barbieri—p 29
- Pluriglandular Diabetes—Cases—F Introna—p 35
- \*Physiopathology of Leukemic Patients—Researches on Transfusions Between Leukemic Patients—R Gosio—p 42

**Physiopathology of Patients with Leukemia**—Gosio says that myelogenous and lymphatic leukemia are two opposite forms of leukemia which are caused by deficiency and excess, respectively, of unknown substances in the blood. He has done



research for ten years on the possible therapeutic effects of repeated blood transfusion between leukemic patients of the same blood group. The transfusions are given in large doses (500 cc each) and can be repeated after ten days. Administration of crossed transfusions between leukemic patients is barred by the difficulties of reciprocal compatibility of blood groups. The author gives direct transfusion from a patient who is suffering from myeloid leukemia to one who is suffering from lymphatic leukemia, or vice versa, and immediately after that, from a normal donor to the leukemic donor. The author found that, when transfusion is done with normal blood in a patient who is suffering from lymphatic leukemia, the number of erythrocytes increases, when it is done between patients who have lymphatic leukemia, leukocytosis increases, whereas, when it is done with the blood of patients with myeloid leukemia, leukocytosis remains undisturbed. Two or four hours after transfusion, free nuclei from myelocytes and products of disintegration of myelocytes appear in the blood and slowly disappear in eighteen or twenty hours. The same results are induced by transfusion of whole blood from patients having myelogenous leukemia as by transfusion of the leukocytes deprived of plasma and suspended in a solution. The myeloid leukocytes are identified in the material which is withdrawn from the lymph nodes and the spleen, by puncture, during the first four hours which follow transfusion. Afterward, and coincidentally with the presence of free nuclei and myelocytic products in the blood, the material from the lymph nodes and spleen fails to show myelocytes or there remain but few disintegrated ones. The author states that foreign leukocytes administered by transfusion do not enter the blood. They are temporarily stored and disintegrated in the lymphopoietic structures which are concerned in the leukemic metaplastic process. The author found by experiments in vitro that the mentioned processes are not due to cytolytic properties of the blood plasma or of the blood serum. They are phases of biologic phenomena which do not take place in vitro. The phenomena are not caused by incompatibility between myelogenous and lymphatic leukocytes. Myelogenous leukocytes go selectively to the tissues which have lymphatic leukocytes. The selective localization of myelocytes in the lymphopoietic structures and the cytotoxicity which takes place there are reactions of defense by which the foreign leukocytes are transformed into substances which stimulate formation of new cells of the same type as those which are given by transfusion and which lack in lymphatic leukemia.

45 53 100 (Jan 10) 1938 Practical Section

\*Bacteria in Cultures and Bactericidal Power of Gastric Juice in Gastritis and Gastroduodenitis. A. Sebastianelli—p. 53

\*Treatment of Inguinal Hernia by Postempski's Operation. G. Cavina—p. 57  
Spontaneous Amputation of Appendix. Case. G. B. Piana—p. 58

**Gastric Juice in Gastritis.**—Sebastianelli performed cultures and bacteriologic studies of the gastric juice of 139 patients who were suffering from gastritis of various types. The author concludes that there is no causal relation between the type of bacteria in the juice and the morphologic type of gastritis. Cultures of the juice give positive results in 72, 50 and 35 per cent, respectively, of the cases of atrophic, hypertrophic and catarrhal gastritis and in 46 per cent of the cases of gastro-duodenitis. The bactericidal power of the gastric juice is altered in 91 per cent of the cases of atrophic gastritis, 72 per cent of those of hypertrophic and catarrhal gastritis and 75 per cent of the cases of gastroduodenitis. The alterations of the bactericidal power of the gastric juice take place much earlier than the appearance of bacteria in the juice. The author states that the determination of the bactericidal power of the gastric juice is of value for an early diagnosis of gastritis and that the test is more reliable than the results of the cultural examination of the gastric juice.

**Treatment of Inguinal Hernia.**—Cavina says that for the plastic reconstruction of the inguinal canal in the treatment of inguinal hernia he resorts to a modification of Postempski's operation, which in turn is a modification of Bassini's. The technique is as follows. The muscular layer, with or without the fascia of the transversalis muscle is sutured by three or four catgut stitches to Poupart's ligament. The aponeurosis of the

external oblique muscle is then sutured, also with catgut, following a direction from the pubic bone toward the anterior superior spine of the ilium. The spermatic cord is made to emerge through the aponeurosis of the external oblique muscle at the highest point near the internal inguinal ring. The sutures at the point of emergence of the spermatic cord are done with silk of an average thickness. The spermatic cord lies bent on the pad and is protected from proximity to the external part of the body by placing in front of it the cellular fascia and the subcutaneous tissue. Recurrences of herniation, especially at the upper region of the incision, are prevented by following the author's technique. The author obtained satisfactory results from the operation in more than 1,000 cases of inguinal hernia. The operation is indicated in inguinal laparocoele, direct and recurrent inguinal hernia, external oblique hernia and also when the spermatic cord is large and may be injured by the scars left by following Bassini's technique.

### Semana Medica, Buenos Aires

45 57 112 (Jan 13) 1938 Partial Index

Treatment of Supra Acromial Luxation of Clavicle. T. Gioia—p. 57  
Extramembranous Pregnancy. Cases. M. V. Falsa and A. Falsa—p. 61  
Spontaneous Choleperitoneum Also Called Biliary Peritonitis and Filtering Cholecystitis. Cases. A. Pierini—p. 65  
Acute Hemopathy After Tonsillectomy. L. Sanchez Moreno—p. 84  
\*Gastroduodenal Perforation. Eighty Five Cases. G. Boneo and E. A. Ramirez—p. 104

**Gastroduodenal Perforation.**—Boneo and Ramirez's study of perforation of gastroduodenal ulcers is based on observations made in eighty-five cases during the last five years in the Pirovano Hospital. All patients but one were men. The authors conclude that perforation of gastroduodenal ulcers take place almost exclusively in men ranging in age from 30 to 40 years, after which it is rare. Perforation occurs more frequently in gastric than in duodenal ulcers and is most frequent in autumn and winter. In the group of patients seen by the authors, perforation took place within the third and sixth hours after ingestion of food or fluids. There was a history of gastric or duodenal disturbances in 94 per cent of the cases. The treatment is surgical and urgent. It consists in simple suture of the perforation, with omentoplasty and without drainage, in patients in good general condition, with short hours of evolution of perforation and who do not show symptoms of peritoneal contamination. Otherwise a local or suprapubic drainage is left. Mortality increases in relation to the age of the patient and to the hours elapsed between the time of the perforation and the surgical intervention.

### Archiv fur Dermatologie und Syphilis, Berlin

176 201 346 (Dec 8) 1937 Partial Index

Aspects of Fordyce's Condition and Its Significance for Clarification of Problem of Localization of Cutaneous Disorders of Oral Cavity. K. Halter—p. 201  
Clinical Aspects and Histology of Chronic Ulcerous Pyoderma. P. Balog—p. 228  
\*Action of Arsenobenzol Preparations on Fetus. L. Vamos and A. Bohm—p. 245  
Diffuse Scleroderma Complicated by Leukemia and Improved by Parathyroidectomy. T. Kusunoki and S. Kuwabara—p. 256  
\*Action of Sodium Borate on Important Fungi. A. Dosa—p. 261  
\*Generalized Herpes Zoster in Leukemia. J. Ferreira Marques—p. 295  
Ecthyma Contagiosum of Sheep and Its Transmissibility to Human Subjects. T. Oppermann and G. Stumpke—p. 337

**Action of Arsphenamine Preparations on Fetus.**—Vamos and Bohm studied the action of arsphenamine on the fetus following administration to the mother. They conclude that arsphenamine can be demonstrated in the organs of the pregnant organism, in the decidual vessels and in the intervillous spaces, but not in the chorion or in the fetal organs. Since the independent defense of the fetus against a syphilitic infection is inadequate as the result of the impermeability of the chorion, it is important that energetic treatment is begun before or at the beginning of the pregnancy.

**Action of Sodium Borate on Fungi.**—Dosa's clinical observations convinced him that borax is of therapeutic value not only in thrush mycosis of the skin but also in other cutaneous mycoses. The author experimented with the alkalization



of fungus cultures Tests were made on cultures of Kaufmann-Wolf's epidermophyton, of saccharomyces and of other fungi Borax in different concentrations was added to the Sabouraud maltose-agar nutrient mediums that contained the fungi To determine whether alkalization was the decisive factor, experiments were made also with dehydrated sodium carbonate, sodium carbonate and boric acid It was found that borax exerts not merely an alkalizing but rather a specific action Although boric acid proved more effective than borax in the culture mediums, the author prefers borax for the treatment, since boric acid is not always harmless for the skin, whereas borax is free from injurious effects, even if used in high concentrations

**Generalized Herpes Zoster in Leukemia**—Ferreira Marques differentiates between idiopathic or primary and symptomatic or secondary herpes zoster He gives attention to the second type, particularly that which develops in chronic leukemia He reports the history of a man, aged 76, who had complained of pains in the left side of the neck and head Later, herpes zoster developed on the same site and gradually involved the whole trunk A week later facial paralysis could be observed and the author assumes that it was connected with the herpes zoster Examination disclosed enlargement of the liver and spleen and the presence of 140,000 leukocytes, of which 92 per cent were lymphocytes The author tabulates the formerly reported cases of herpes zoster and leukemia Of forty-two cases of herpes zoster, thirty-four were associated with lymphatic leukemia and only three with myeloid leukemia The herpes zoster develops usually between the second and third year of the leukemia Herpes zoster is most frequent in patients between the ages of 50 and 60 The majority of patients are men Paralysis was observed in two cases of facial paralysis and two of paralysis of the extremities From a study of the literature and observations on the reported case, he concludes that there is nothing known to contradict the theory that the herpes zoster in leukemia is caused by a virus

### Klinische Wochenschrift, Berlin

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- Acute Porphyria and Hemoglobinuria W von Drigalski—p 1779  
Determination of Conductors and Distribution of Blood Groups in Hemophilia S Lofgren—p 1782  
Experimental Contribution to Hypophyseal Manifestations of Abolished Function by Hormones of Anterior Lobe of Hypophysis H E Neve—p 1785  
Relations Between Spinal Parasympathetic and Trophic Innervation of Fat Tissue Ken Kure Toshio O and Shigeo Okimura—p 1789  
\*Vitamin C Elimination in Urine and Vitamin C Content of Cerebrospinal Fluid in Nervous Disorders Olga Altmann and Helene Goldhammer—p 1793  
\*Chemical Composition of Normal and Pathologic Bile of Liver and Gallbladder E Prado Tagle and G Kurth—p 1795  
Recognition and Evaluation of Chronic Tonsillitis in Rheumatic Diseases F Knuchel—p 1797

**Vitamin C in Nervous Disorders**—Altmann and Goldhammer made protracted tolerance tests with vitamin C in twelve patients with nervous disorders Their aim was to detect a possible relationship between a diffuse, anatomically demonstrable impairment of the central nervous system and a disturbance in the vitamin economy The results of the tests gave no indications of such a relationship Thus the authors were unable to corroborate Bersot's opinion, according to which a retarded or lacking elimination of vitamin C, after a prolonged tolerance test, is the manifestation of a metabolic disturbance in the brain However, the results did indicate that age plays some part in the retarded elimination The manner of elimination of the vitamin during the tolerance test was not dependent on the values that were observed before the tolerance test was begun After the tolerance test was completed, the increased elimination ceased suddenly The authors also determined the vitamin C content of the cerebrospinal fluid of twenty-four patients with various nervous and mental disturbances In comparing the results with the normal averages determined by Plaut and Bülow in persons without cerebral disturbances, they found that the vitamin C content of the cerebrospinal fluid was reduced in such disorders as epilepsy, tabes dorsalis, dementia paralytica, cerebral arteriosclerosis, latent syphilis and enterococcic myelitis The greatest deficit was found in a case of herpes zoster

**Chemical Composition of Normal and Pathologic Bile**—Prado Tagle and Kurth investigated the chemical composition of the normal bile of the liver and of the normal and pathologic bile of the gallbladder On the basis of their observations they reach the conclusion that impairment of the gallbladder is characterized by an almost 100 per cent increase in the mucin content of the bile There is also a considerable increase in bile salts The dry residue is low, which indicates a decrease in the substances that are dissolved in bile and thus also a reduction in the concentration capacity of the gallbladder The bilirubin and cholesterol contents are normal These observations suggest that, in case of impairment of the gallbladder, that chemical function of the liver which concerns the formation of bile acids is impaired It seems to be reduced In contradistinction to this, the capacity for the elimination of cholesterol and bilirubin is intact The content in these "waste substances" is frequently even increased This disturbance in the chemical function of the liver is probably a contributing factor in the development of gallstones, for bile salts facilitate the solubility of cholesterol and bilirubin The lack of these substances favors the precipitation of the lipids and of the biliary pigments These factors throw light on the pathogenesis of gallstones, particularly if the increase in mucin is likewise taken into account The latter interferes with the evacuation of the gallbladder, because it increases the viscosity This in turn produces biliary stasis and favors the growth of microbes in the infected gallbladder Mucin promotes the accumulation of sediments This is important for the formation of the nucleus of gallstones The hypersaturation phenomena of cholesterol and bilirubin promote the growth of gallstones around this nucleus

### Monatsschrift für Kinderheilkunde, Berlin

71 305 460 (Dec 13) 1937

- Contribution to Problem of Renal Infantism W Malz—p 305  
Lymphadenitis and Nephritis in Scarlet Fever J Wolff—p 310  
Solitary Tubercle in Pons Varoli in Nursling Aged 8 Months H Peter—p 316  
\*Tetany During Early Infancy H Baar—p 321  
\*Syndrome of Waterhouse-Friderichsen A Kamber—p 351  
Influence of Phosphoric Acid on Mineral Metabolism of Children E Bauer—p 374  
Investigations on Bone Marrow in Living Nurslings G Joppich and P Liessens—p 382

**Tetany During Early Infancy**—Reviewing the literature on tetany of early infancy, Baar points out that, whereas some authorities deny the appearance of this disorder during the first months of life, others consider it a rather frequent occurrence It is difficult to diagnose tetany during early infancy because tetany of the new-born, brain lesions caused by the trauma of birth and septic encephalitis of the new-born may cause the same symptoms Even the symptoms of latent tetany, particularly those of mechanical hyperirritability, may fail The only sign that has pathognomonic value is that of Thiernich Mann (cathodic hyperirritability), and even this is of use only when it is positive If it is absent, it is necessary to make a chemical analysis of the blood or to analyze the acid base equilibrium in the urine The author reports two cases of tetany that occurred during early infancy The first case proved to be a tetany caused by an absolute phosphate stasis, which in turn, was presumably caused by a disturbance in the central regulation In the second nursing there existed a hematogenic alkalosis caused by hyperthyroidism The author emphasizes that among the cases of tetany of early childhood it is necessary to differentiate the early form of rachitogenic tetany and the tetany of early infancy in the strict sense of the term The pathogenesis of the latter is not uniform Among the cases described in the literature, three different forms can be differentiated and on the basis of the described observations two forms should be added to these, namely the tetany caused by absolute phosphate stasis and the thyrogenic tetany

**Syndrome of Waterhouse-Friderichsen**—Kamber reviews the earlier literature on the syndrome of Waterhouse-Friderichsen and then describes a case observed at the children's hospital in Bern Of the sixty-two cases reported so far, forty concerned children less than 2 years of age How

ever, the literature reports also twelve cases occurring between the ages of 18 and 24 years and two in middle age. In the majority of cases there is no prodromal stage, the syndrome develops suddenly in children who have apparently been in complete health. The child wakes up with a sudden cry and soon there is vomiting. The face becomes pale and then cyanotic. Consciousness is more or less impaired. The temperature may at first be only slightly above normal but it increases rapidly. The respiration is accelerated and accompanied by sounds. Occasionally tonic clonic twitching is observable on the face and arms. These spasms may last for several minutes. In the reported case they recurred until the fatal outcome. Following the period of jactitation, the child becomes quiet and apathic, the facial expression is anxious, the eyes are dull and half open, the temperature rises to extreme heights, the pulse is extremely rapid and soft, the blood pressure is so low that it can hardly be measured, the respiration is greatly accelerated, superficial and of the pneumonic type, movements of the ala nasi are often observable. The abdomen is usually somewhat inflated but soft and not sensitive. Aside from loss of consciousness and the tonic clonic convulsions, there are hardly any nervous symptoms. The cerebrospinal fluid is usually normal. Several hours before death, petechial hemorrhages appear and these are usually followed by a generalized purpura. The respiration becomes of the Cheyne-Stokes type. Nystagmus, strabismus and convulsions may precede death. The disease takes its course in from six to twenty-four hours. In adults the clinical course is similar to that in children, except that meningitic symptoms are more frequent. The cutaneous symptoms, which may suggest exanthematic infectious diseases, are important for the diagnosis as is also the cyanotic coloration of the skin, which involves especially the face, trunk and lower extremities. The gray and violet-blue spots give the body a marmorated appearance. Moreover, the extremities may become cold while the trunk is still hot. Discussing the pathologic anatomy of the Waterhouse-Friderichsen syndrome, the author stresses the changes in the adrenals. These organs are usually slightly enlarged and show a purple-red to brownish black discoloration, the result of the profuse blood supply. They may be veritable sacs of blood with only slight remnants of normal glandular tissue. Microscopic examination reveals hemorrhagic infarction of the cortex and medulla. Microscopic examination of the cutaneous petechiae discloses dilatation of the vessels and diapedesis into the tissues. Necropsy reveals that mucous membranes as well as the internal organs may have petechiae or hemorrhages. The central nervous system often shows hyperemia. Etiologically, hyperacute infection has been suggested and there is evidence that meningococci play an important part. Constitutional factors are apparently of importance. Status thymicolymphaticus is mentioned in many reports or there may be a hyperplasia of the lymphatic system. In view of the unfavorable prognosis, therapy is of little avail. However, in addition to combating the circulatory collapse, specific serotherapy and blood transfusions could be tried and, to counteract the adrenal insufficiency, cortical extracts, epinephrine and dextrose should be given.

### Wiener klinische Wochenschrift, Vienna

50 1763 1794 (Dec 31) 1937

- \*Basal Metabolism and Hyperthyroidism J. Bauer—p. 1763
- Crisis of Pathophysiology A. Greil—p. 1766
- Cytologic Examination of Palatine Tonsils and Its Clinical Significance in Leukemia H. Brunner and J. Schnierer—p. 1772
- Nature and Therapy of Spondylarthritis A. Lux—p. 1774
- Progress in Therapy of Female Gonorrhea S. Wolfram—p. 1776

**Basal Metabolism and Hyperthyroidism**—Bauer points out that it has been assumed that the elevation of the basal metabolic rate which is produced by an increase in the organic processes of combustion is the result of some catalytic stimulation of the cellular oxidation by thyroxine. Eppinger, however, suggested an entirely new hypothesis regarding the cause of the increase in the basal metabolism during hyperthyroidism. In the musculature of patients with hyperthyroidism and in that of animals poisoned with thyroxine Eppinger discovered a thickening of the capillary walls and other changes, which he interpreted as a sign of serous inflammation. He reasoned that these changes inhibit the passage of the oxygen from the

blood into the tissues, that is, that they result in a deficient oxygen supply of the musculature, which in turn would impair the resynthesis of the lactic acid that is produced by the contraction. Since larger quantities of oxygen are required to remove the lactic acid, the oxygen debt is increased above the normal. Bauer criticizes Eppinger's theory. He shows that the increase in basal metabolism in patients with hyperthyroidism is caused by a direct action of the thyroid hormone on the cells, the anabolic cleavage processes of which are augmented and the oxygen consumption of which is consequently increased. Disturbances in the carbohydrate content of the muscle cause disturbances in the muscular activity and thus explain the disappearance of glycogen, the accumulation of lactic acid and the greater oxygen debt after muscular work. The organism compensates for the increased oxygen requirements by greater peripheral blood perfusion. Increased minute volume, greater circulatory velocity and other factors make possible an adequate oxygen supply for the tissues. As a result of these processes, the tissues can be supplied with more oxygen without there being an increased utilization and a greater arteriovenous difference in the oxygen. The author concludes that an increasing effect on the metabolism must be regarded as the specific action of the thyroid hormone and that Eppinger's theory must be rejected.

### Vrachebnoe Delo, Kharkov

20 337 416 (No 5) 1937 Partial Index

- Lysate Therapy S. G. Genes—p. 337
- Lysate Therapy in Cardiovascular Diseases E. A. Chernikov, E. V. Sterkin, S. Kh. Mal'yar and F. M. Vengerova—p. 343
- Lysate Therapy of Gastric and Duodenal Ulcers N. M. Dukhin—p. 349
- \*Lysate Therapy of Muscular Dystrophy D. M. Zalkan and R. M. Kurzon—p. 353
- \*Lysate Therapy of Chronic Polyarthritis P. R. Normark, P. F. Frolov, Z. S. Edel, I. M. Markus, I. S. Leonov, M. O. Pasko and N. I. Sokolovskaya—p. 367

**Lysate Therapy of Muscular Dystrophies**—Zalkan and Kurzon report the effect of lysate therapy in fourteen cases of chronic progressive muscular atrophy. Myomyelohepato ovarian or testicular (depending on sex) combinations of lysates were used together with administration of strychnine after the method of Bier and Gehrke. Each patient was given four courses of treatment consisting of twenty injections each. The interval between individual injections amounted to two weeks. A definite subjective and objective improvement was noted in ten. The improvement was noted in the course of the treatment or, more frequently, at the end of or sometime after the treatment. The patients developed a sense of well being, an increase in energy and working capacity and a diminution of fatigue. The gait improved, the patients did not fall as frequently and were able to descend and to climb stairs with greater ease. There was an increase in the muscular power and an increase in the circumference of the extremities. In some of the cases a lowering of the threshold of the electrical excitability was noted. The improvement lasted from six months to two years. The authors do not claim for histolysates the ability to effect cure in cases of progressive muscular atrophy. However, in view of the utter helplessness of these patients the improvement they have noted in their cases is significant. The mode of action of lysate therapy in these cases is not understood.

**Lysate Therapy of Chronic Polyarthritis**—Normark and his associates report the results obtained with chondrolysates, arthrolsates alone and in combination with galvanotherapy in ninety-eight patients, forty-eight of whom suffered from chronic rheumatic polyarthritis and fifty from chronic infectious arthritis. The injection of lysates alone or in combination with galvanotherapy produced both focal and general reaction of the kind observed in all methods of nonspecific protein therapy. As a result of a course of graded doses of intracutaneous injections of lysates alone for a period of from thirty to thirty-five days in twenty-four cases of chronic and subacute infectious polyarthritis the authors noted in twenty-two improvement of the local lesions and of the general state of health. The combination of the lysate therapy with galvanotherapy gave an even better result. They have noted a

considerable improvement in the majority of the patients, amounting in some cases to a clinical cure. They have demonstrated, in patients showing improvement in symptoms, a simultaneous return to the normal on the part of the vegetative nervous system, of the reflexes, of the potassium-calcium index and of the leukocytic formula, as well as an increase in the quantity of hemoglobin, diminution of the leukocytosis and of the number of reticulocytes, and a retardation of the sedimentation speed. The positive results persisted in about two thirds of the cases for one year. Recurrences were observed most frequently in the cases of rheumatic polyarthritis.

### Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

81 6099 6162 (Dec. 25) 1937

General Cutaneous Pigmentation in Internal Diseases P. Formijne — p. 6100

\*Tests in Connection with Several Unsolved Problems Concerning Epidemiology of Weil's Disease P. H. Van Thiel — p. 6106

Tubal Pregnancy A. J. M. Duyzings — p. 6128

Rare Neurologic Disturbances During Pregnancy and After Delivery G. Stael — p. 6136

**Epidemiology of Weil's Disease**—Van Thiel reports investigations on some unsolved problems in connection with the epidemiology of Weil's disease. The first question he takes up is how long *Leptospira icterohaemorrhagiae* survives in free surface water. His investigations revealed that during the swimming season it survives for at least twenty-two days and that its virulence remains intact during this entire period. After six days these pathologic leptospirae have a tendency to go to deeper levels. Near mud or in water that is contaminated with urine, the organism can keep alive without loss of virulence for at least five or seven days. In waters that are used for bathing and swimming, the leptospirae may be brought from the deeper to the higher levels and may infect the swimmers. Bathing establishments situated on open waters and from which rats are kept by means of wooden partitions are not sufficiently safe, because the wooden partition will not prevent the entrance into the swimming establishment of the leptospirae excreted by rats outside the partition. Guinea pigs can be infected with the avirulent as well as with the virulent strains of *Leptospira icterohaemorrhagiae*. Moreover, the animal organism can be invaded by the saprophytic *Leptospira pseudointerrogans*. Although epidemiologic data do not indicate that human beings become infected with *Leptospira canicola* during bathing, this is nevertheless possible under certain conditions. In connection with experiments on guinea pigs, it is assumed that the infection of human subjects with a few avirulent organisms of *Leptospira icterohaemorrhagiae* protects against a mild infection with virulent leptospirae of the same species only in case of a response of the organism to this immunizing infection, which is indicated by the development of agglutinins or lysins. Experiments on guinea pigs give promise that immunization of human subjects to a degree that provokes only a low titer in the serum will generally provide protection against Weil's disease.

### Finska Lakaresällskapets Handlingar, Helsingfors

80 785 849 (Oct.) 1937

\*Diagnosis and Treatment of Bronchiectatic Disorder J. Holst — p. 794  
Roentgen Treatment of Thyrotoxic Edema of Temples J. Wahlberg — p. 813

Method for Otologic Diagnosis of Cerebrospinal Fluid H. Björk — p. 818

**Treatment of Bronchiectatic Disorder**—Holst states that the bronchiectasis is the product of two factors, distended bronchi and infection. Diagnosis is verified roentgenologically by bronchography. Complicating pneumonia, pulmonary abscess, empyema or metastatic abscess, often occurring surprisingly late, is the frequent cause of death. Treatment is surgical (lobectomy). Patients having bronchiectatic cavities excrete massive quantities in the first few hours after rising. Possible bronchiectasis should be considered in suspected pulmonary tuberculosis when tubercle bacilli cannot be demonstrated in the sputum. In cases complicated by pneumonia, abscess or empyema, diagnosis may be especially difficult. Bronchiectasis may be latent for years. The technic of lobec-

tomy is not yet fully solved. Most bronchiectatic disorders alternate between periods with more scanty and with more profuse expectoration, operation should be timed for the drier period. Temporary pneumothorax was done four or five days before operation. He stresses full narcosis before the opening of the pleura and tries by large morphine-scopolamine doses to suppress the cough reflex before the beginning of narcosis. His present view is that lobectomy is not indicated in clinically latent cases or in those showing only periodic symptoms, with moderate amount of expectoration and nonfetid expectoration. It is indicated in patients with more than 40 or 50 Gm of expectoration daily or with fetid expectoration. The nineteen cases of primary bronchiectasis reported illustrate the tendency of the disorder to be localized in one of the lower lobes. In three cases there were large bronchiectatic cavities. In nine cases the diagnosis had been pulmonary tuberculosis. In half the cases the symptoms began in childhood, in one third in early childhood and in one instance at the age of 40. Ten lobectomies were done, two in one patient who died from empyema after the second intervention. Most of the patients had a rather marked postoperative reaction. Seven are without symptoms.

### Hospitalstidende, Copenhagen

80 1333 1356 (Dec. 21) 1937

\*Microscopic Investigations in Some Cases of Fibro-Adenomatosis of Breast with Especial Regard to Effect of Treatment with Estrogen. F. Sprensen — p. 1333

**Estrogen in Treatment of Fibro-Adenomatosis**—Sprensen made seventeen biopsies in sixteen patients, ranging in age from 16 to 46, with fibro-adenomatosis of the breast. In the eight untreated patients he found the hyperplasia of the intra-lobular connective tissue considerably more intense than in the nine who were treated with estrogen. In the patients treated with estrogen there was a remarkable succulence resembling normal menstrual edematization in the intralobular connective tissue. Cytologic examinations of the glandular epithelium in the premenstrual, menstrual and postmenstrual stages of the two groups showed enlargement of the Golgi substance and closer arrangement of the mitochondria. The same relation was seen in two patients effectively treated with estrogen and examined in the interval stage. In four patients of seven examined before treatment the excretion in the urine of gonadotropic substance, estrogen or both was reduced.

### Hygiea, Stockholm

89 897 928 (Dec. 31) 1937

\*White Blood Corpuscle Picture in Uncomplicated Pleurisy in Pneumothorax and in Pleurisy in Pneumothorax with Simultaneously Occurring Aggravation of Parenchyma Process H. Hallander — p. 904  
Common Descent of Eighteen Physicians S. Tingvall — p. 910

**White Corpuscles in Pleurisy**—Hallander says that, at the start of the pleurisy in his twenty-seven cases, no difference was demonstrable between the degree of shifting to the left in the sixteen uncomplicated cases and the eleven with aggravation or spread of the pulmonary process, but that in the latter the shifting to the left due to the aggravation of the parenchyma process continued after the pleurisy began to recede. When the pleurisy set in slowly and without particular reaction in shifting to the left, there appeared at the beginning of the aggravation of the pulmonary process an increased shifting to the left which did not correspond to the exacerbation of the pleurisy and which increased parallel with the progression of the process. The difference between the blood picture in the uncomplicated cases and in those with aggravation of the parenchyma process was so marked that, after the general reaction accompanying the onset of the pleurisy subsided, examination of the white blood corpuscle picture afforded an indication of the cases in which an aggravation of the pulmonary process was to be expected. In five of the eleven cases the continued shifting to the left after both temperature and sedimentation values had become normal was the only sign that the aggravation still persisted. In two of the cases the aggravation was not roentgenologically demonstrable until after the temperature and sedimentation values had fallen.

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## DOES DIGITALIS INFLUENCE THE COURSE OF CARDIAC PAIN?

A STUDY OF 120 SELECTED CASES OF ANGINA PECTORIS

HARRY GOLD, M.D., HAROLD OTTO, M.D.  
NATHANIEL T. KWIT, M.D.  
AND  
HARRY SATCHWELL, M.D.  
NEW YORK

In accordance with the prevailing view that cardiac pain results chiefly from relative cardiac ischemia, any one or a combination of several primary changes in cardiovascular dynamics may be considered competent either to produce or to relieve this symptom in patients with angina pectoris, such as changes in heart rate or rhythm, systemic blood pressure, return flow, stroke volume, minute volume, and size of the coronary bed. The influence of the digitalis bodies on the foregoing functions is variable, and from the extensive pharmacologic literature observations may be assembled in the support of divergent possibilities, namely, that pain is uninfluenced, that it is increased or that it is diminished by members of this group of drugs.

The experimental results which appear to have exerted a strong influence on clinical views are those which indicate that digitalis may directly constrict the coronary arteries. It is stated that through this action<sup>1</sup> digitalis may increase the pain in patients suffering with attacks of angina pectoris although some investigators have failed to find sufficient basis for such a belief<sup>2</sup> and others have found that the glucosides increase coronary flow.<sup>3</sup> The clinical literature on the subject consists, for the most part, of isolated observations<sup>4</sup> and general impressions. A more extensive report was published by Fenn and Gilbert<sup>5</sup> which also provides a review of the literature. They presented an account

of the case histories of seven patients as representative of others in their experience, from which they concluded that digitalis produces anginal pain and is particularly liable to do this in patients with angina pectoris. Their conclusion was derived, in some of these cases, from the fact that during a course of digitalis pain appeared or was increased and, in other cases, from the fact that this phenomenon could be reproduced during more than one trial. In view of the capricious behavior of cardiac pain during treatment by various agents, as we have had occasion to learn in a previous study<sup>6</sup> on the effect of the xanthines on this symptom, such observations, we believe, can be considered suggestive but as evidence are too weak to support the belief that digitalis in therapeutic doses is particularly liable to provoke pain in persons with angina pectoris by a specific action on the heart or blood vessels.

Accordingly, an investigation was undertaken to secure evidence on the question of whether digitalis exerts any influence on the course of pain in patients with angina pectoris, and this report presents the results.

### SELECTION OF PATIENTS

The subjects were 120 ambulant patients in attendance at the cardiac clinic, for whom the diagnosis of arteriosclerotic heart disease with cardiac pain was made, in accordance with the nomenclature and criteria adopted by the New York Heart Association.<sup>7</sup> The study was conducted during a period of seven years. The duration of observations in any given case varied from two to sixty-four months, the average being twenty-one months.

Some of the characteristics of the whole group are listed in table 1. They were selected from a total case load of approximately 1,000 patients, representing an average sample of the cardiac clinic population comprising several racial groups, both native and foreign born. The majority were without occupation. None of these patients had signs of congestive heart failure. Only patients with pain on effort were studied, and although some patients with true cardiac pain were excluded by the restriction, this measure served to insure against the inclusion of patients in whom the thoracic pain might be of noncardiac origin.

The severity of the pain varied greatly, from mild substernal pressure or discomfort induced by moderate effort only slightly interfering with the patient's ability to carry on (1+), to excruciating pain induced by the slightest effort occurring also when the patient was at rest so as to cause almost complete incapacity (3+).

Faithful assistance was rendered throughout the course of this study by Miss Ida Wolfson, volunteer to the cardiac clinics.

From the Department of Pharmacology of Cornell University Medical College and the Cardiac Clinics of the Hospital for Joint Diseases and the Beth Israel Hospital.

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7 Criteria for the Classification and Diagnosis of Heart Disease.

Careful questioning of the patient at every visit to the clinic made it possible to exclude the cases in which there was reason to believe that cooperation in the uninterrupted use of whatever drug was issued and in the accurate reporting of any omissions was not sufficiently faithful for the purpose of this study.

TABLE 1—Classification of 120 Patients with Arteriosclerotic Heart Disease and Cardiac Pain

Average age	57.6 years
Age range	40-82 years
Number of males	103
Number of females	17
Number with hypertension (28 males 10 females)	38
Number with electrocardiographic changes indicating myocardial damage	64
Number with coronary thrombosis (42 males 4 females)	46
Classification of pain based on severity, duration and frequency of attacks and degree of physical limitation	
Slight (1+)	16
Moderate (2+)	54
Severe (3+)	50
Occupation	
Number not working	98
Number working (11 women doing limited housework, 3 men engaged in light part time work, 8 men engaged in light full time work)	22
Range of periods of study	2-64 months
Average period of study	21.7 months
Range of number of courses with digitalis	1-7
Average number of courses with digitalis	2.02
Total number of courses with digitalis	243
Range of duration of courses with digitalis	1-68 weeks
Average duration of courses with digitalis	11.1 weeks

#### DRUGS AND OTHER TREATMENT

Most of the patients had been in attendance at the clinic a long time when the study was started, and many of them were already subject to restrictions in diet and effort. No further advice was given for modification of habits or activities.

The dried digitalis leaf was administered in compressed tablets of 1, 2 or 3 cat units each.<sup>8</sup> The daily quantity was given in a single dose. A tincture of digitalis was also given in a few cases in which observations suggested the need of the same drug in a different form. The general plan was to start with a moderate daily dose of 2 cat units (0.2 Gm.), increasing the dose after one week to 4 (0.4 Gm.) and then to 6 cat units (0.6 Gm.) unless minor toxic symptoms appeared. The highest daily dose was 2 cat units in 3.4 per cent of the cases, 3 cat units in 5 per cent of the cases, 4 cat units in 54.1 per cent of the cases and 6 cat units in 37.5 per cent of the cases. Minor toxic symptoms, nausea, vomiting or heart block, were produced in forty-six cases (38.3 per cent).

The digitalis was given in courses lasting from one to sixty-eight weeks, the average lasting eleven weeks. Some patients received as many as seven courses, the average was two courses for each patient. Several courses of treatment with digitalis and the placebo were carried through, especially in the cases in which obvious factors that might vitiate a valid comparison existed, such as change of diet, weather or work. In all, 243 courses of treatment with digitalis were given. These were frequently alternated with periods in which the patient received various agents as controls, such as sodium salicylate, acetylsalicylic acid, calomel, cascara, mixture of rhubarb and soda, phenobarbital, codeine or a xanthine. In each case a comparison was made of the effect of the digitalis with that of lactose.

<sup>8</sup> The specimen supplied by the New York Heart Association was used in the case of the tablet. Its potency was 80 mg. per cat unit.

#### METHOD OF SECURING DATA

The method of securing the data was similar to that used in a previous study<sup>6</sup> on the effect of the xanthines on cardiac pain. The details of the method, the sources of error and the means (the "blind test") employed for guarding against errors are described in that paper. Briefly, the data consisted of the patient's judgments as to whether, during a given period, the cardiac pain had remained unchanged, had increased or had diminished, the severity and frequency of attacks and the capacity for effort without pain being taken into account. The point of reference was the patient's habitual status.

The data (changes in pain) thus obtained were charted, and the charts were used in the study of the question of cause and effect. It was not deemed safe to attempt to assign a cause for all the changes in pain since diverse factors usually coexist in such cases, which might be responsible for changes in cardiac pain during the use of a drug. The assurance with which patients often ascribed the production as well as the relief of pain to a placebo tablet rendered their convictions unreliable as a means of establishing these relationships. It was assumed that if digitalis significantly increased or diminished cardiac pain, such a record of the facts as we obtained should reveal it. The presence or absence of unequivocal differences in the appearance of the charts between periods in which the patient used a placebo and those in which he used digitalis would therefore provide the evidence concerning a causal relation. In cases in which such differences did appear with digitalis in the form in which it was first used, its form, color and taste were subsequently disguised in such a manner as to preclude its detection by the patient through any means other than the influence on pain. The validity of the controls was enhanced by the fact that the duration of the courses with the control agents and with digitalis were fairly long and that the patient received repeated courses of each, often in different seasons of the year and under other conditions as nearly comparable as possible.

#### RESULTS

The data on changes in pain during the first period of treatment with a placebo were compared with those during a period in which digitalis was used. This period represented from one to several weeks in the case of

TABLE 2—Comparison of Changes in Pain During First Period of Treatment

Number of Patients	Digitalis		Placebo	
	Number	Percentage	Number	Percentage
Pain unchanged	67	50	80	71.4
Pain diminished	26	30	16	13.3
Pain increased	15	10	18	15
	120		120	

each. As may be seen in table 2, in 45 per cent of the patients a change took place, 30 per cent reported diminished pain and 15 per cent increased pain during the use of digitalis. However, during the first period of treatment with an inert tablet of lactose, 28.3 per cent of the patients reported a departure from their habitual status, 15 per cent reported increased pain and 13.3 per cent decreased pain.

Whether digitalis by its specific systemic action is responsible for the changes in pain can be learned only

From a study of the complete charts of the individual cases, showing the changes of pain during periods of various control agents alternated with periods of digitalis. In these charts the intensity of the pain as compared with the habitual status was graded, and three grades in each direction were considered: increase or decrease of pain, slight, moderate or marked. It is feasible to present the charts of only a few of the cases to illustrate the manner in which the study was pursued and the type of results which served as a basis for conclusions regarding the influence of digitalis on the course of cardiac pain.

As in the case of a previous study,<sup>6</sup> the charts of the 120 cases fell into four types:

(a) Those in which the habitual status remained constant and apparently uninfluenced by any drug that was used (10 per cent)

(b) Those in which temporary departures from the habitual status were always in the direction of increased pain (33 per cent)

(c) Those in which temporary departures were always in the direction of improvement (20 per cent)

(d) Those in which the condition fluctuated markedly in both directions (61.7 per cent)

A careful examination of the illustrative charts of cases 1 to 16 (charts 1, 2 and 3) shows that an increase or decrease of pain, as the case may be, occurring during the use of digitalis, was reproduced in every instance by a placebo or another control agent. The lack of causal relationship between the specific action of the digitalis and the change in pain is directly disclosed in the majority of cases by the disappearance of the change even when, as in some cases, administration of the drug was continued or, as in others, after an interruption a course of digitalis medication was repeated. In cases in which the use of the drug in tablet form was attended by increased pain during more than one course, the change vanished when the tincture in equivalent doses was substituted, indicating clearly that the increased pain was not due to a direct action of the digitalis on the heart or circulation.

#### COMMENT

The results obtained in this study are similar to those of others where the conditions are comparable.

They show that some patients report an increase in the severity of cardiac pain and others a decrease during the use of digitalis. The additional steps which we took in order to determine the role of digitalis in the causation of these changes, namely, comparison with a placebo, the "blind test," repeated long courses of digitalis with the form, taste and color of the drug masked, reveal however, that the systemic

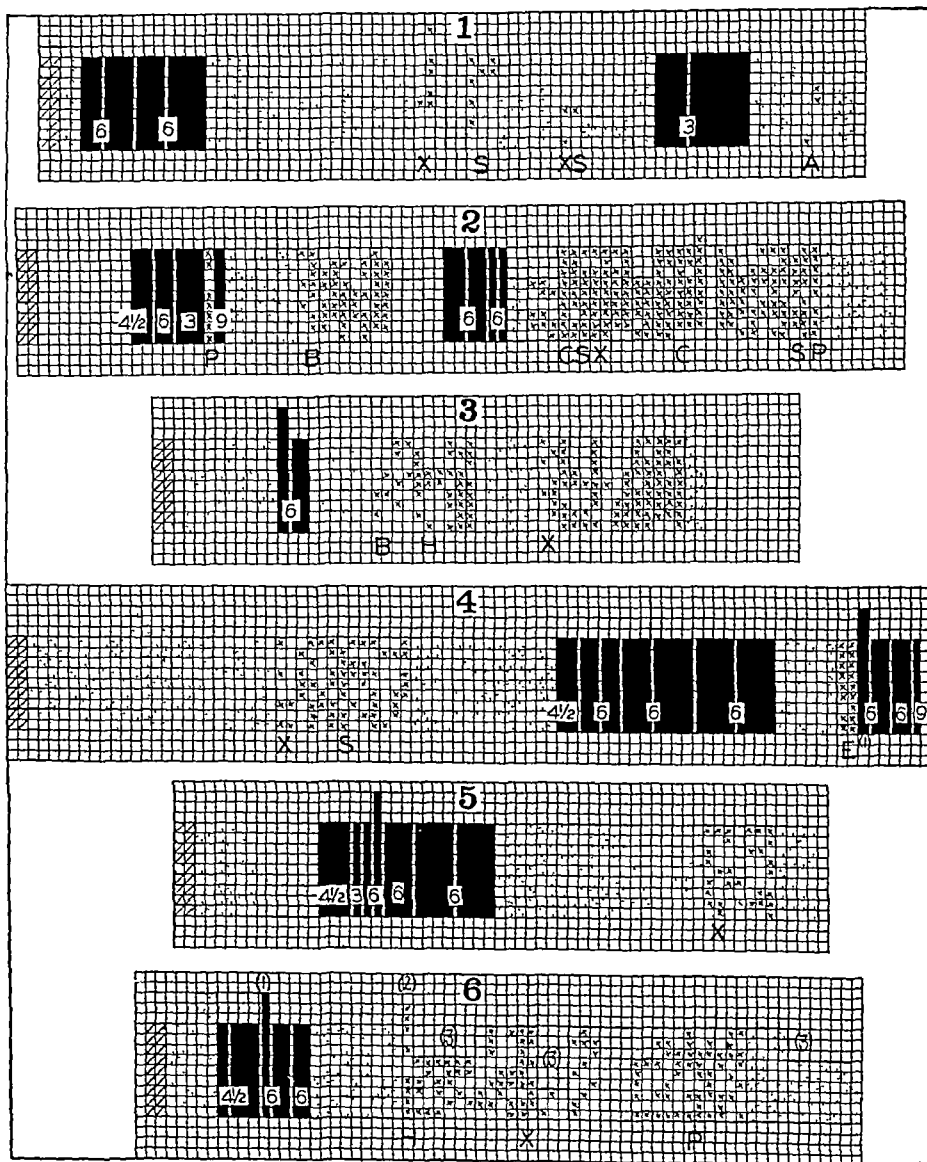


Chart 1—Course in cases 1 to 6. The first column of each chart is made to represent the habitual status of the patient. It is arbitrary nine squares high and a column of the same height may refer to pain of different severity in different patients. The periods between individual visits to the clinic are marked off by the dark lines or by white lines between black columns. An increase in pain is indicated by an upward direction of the column and a decrease by a downward direction as follows: slight (change of column by three squares), moderate (change of column by six squares), marked (change of column by eight squares). The solid black columns always indicate digitalis. The dotted columns always indicate a placebo. The cross-hatched columns always indicate active agents and are labeled as follows:  $\lambda$  (xanthine),  $S$  (sodium salicylate),  $H$  (calomel),  $B$  (sodium bicarbonate),  $CS$  (cascara sagrada),  $C$  (codeine sulfate),  $B$  (barbital),  $P$  (phenobarbital),  $A$  (acetylsalicylic acid), and  $E$  (physostigmine salicylate). Blank columns indicate periods without medicine. The numbers on the black columns indicate the daily dosage of digitalis in grains or where indicated minims of the tincture of digitalis.

action of the glucoside is not responsible for the changes in cardiac pain.

These results are not to be taken to indicate a belief that digitalis under no circumstances influences cardiac pain. It is well known that cardiac pain occurring in the course of heart failure with congestion is relieved by digitalis which restores compensation. There are



also instances of heart failure in which the relief of congestion by digitalis appears to establish or increase the severity of attacks of cardiac pain. Since digitalis exerts several actions it is not remarkable that the result of conflicting effects should occasionally intensify cardiac pain in a person in whom one or another function may show inordinate susceptibility. This is quite apart, however, from the customary actions of the drug. The patients we studied were those with coronary artery disease with angina pectoris and without signs of congestion. In this group, comprising persons who are unduly susceptible to reduction of coronary flow, not one instance was encountered presenting unequivocal evidence that digitalis had intensified the cardiac pain,

3 The effect studied was the influence on the severity and frequency of attacks of pain and on the capacity for effort without pain. The data were secured in accordance with a plan designed to reduce to a minimum common sources of error and in a manner relatively free from bias by the use of the "blind test."

4 In all, 243 courses of treatment with fairly large daily doses of digitalis (from 0.2 to 0.6 Gm.) were given, each lasting an average of eleven weeks and being alternated with a course of a placebo of lactose or some other agent.

5 The course of the pain was charted, the habitual status as well as graded departures from it being represented in every case. The causal relation was established by a method relatively free from personal judgments, namely, by comparing sections of the chart representing respectively, placebo and digitalis periods.

6 The results show that nearly one half of all the patients reported a departure from their habitual status on their return visit after the first course of treatment with digitalis, in about 15 per cent the pain was increased and in about 30 per cent it was diminished. Results bearing a strong similarity to these were obtained, however, during the use of a placebo.

7 In most cases the change in pain failed to persist when administration of the drug was continued or failed to reappear during repeated courses of digitalis.

8 In the remaining cases in which the change occurred when the course of digitalis was repeated, it was possible to digitalize fully without any apparent effect on pain by altering the form, color or flavor of the preparation of digitalis.

It is concluded from these facts that in cases of

angina pectoris without congestion the likelihood is negligible that the use of digitalis will, by a direct action on the circulation, increase or diminish cardiac pain.

In view of the fact that the patients of this series were presumably unusually susceptible to cardiac ischemia the results indicate further that digitalis even in large doses rarely, if ever, produces effective constriction of the coronary arteries in man.

REPORT OF CASES

CASE 1 (L. L. a man aged 44)—The diagnosis was arteriosclerosis hypertension enlarged heart coronary and aortic sclerosis regular sinus rhythm and pain 3+. The duration of study was seventy six weeks.

CASE 2 (A. K. a man aged 53)—The diagnosis was arteriosclerosis coronary thrombosis regular sinus rhythm and pain 3+. The duration of study was eighty two weeks.

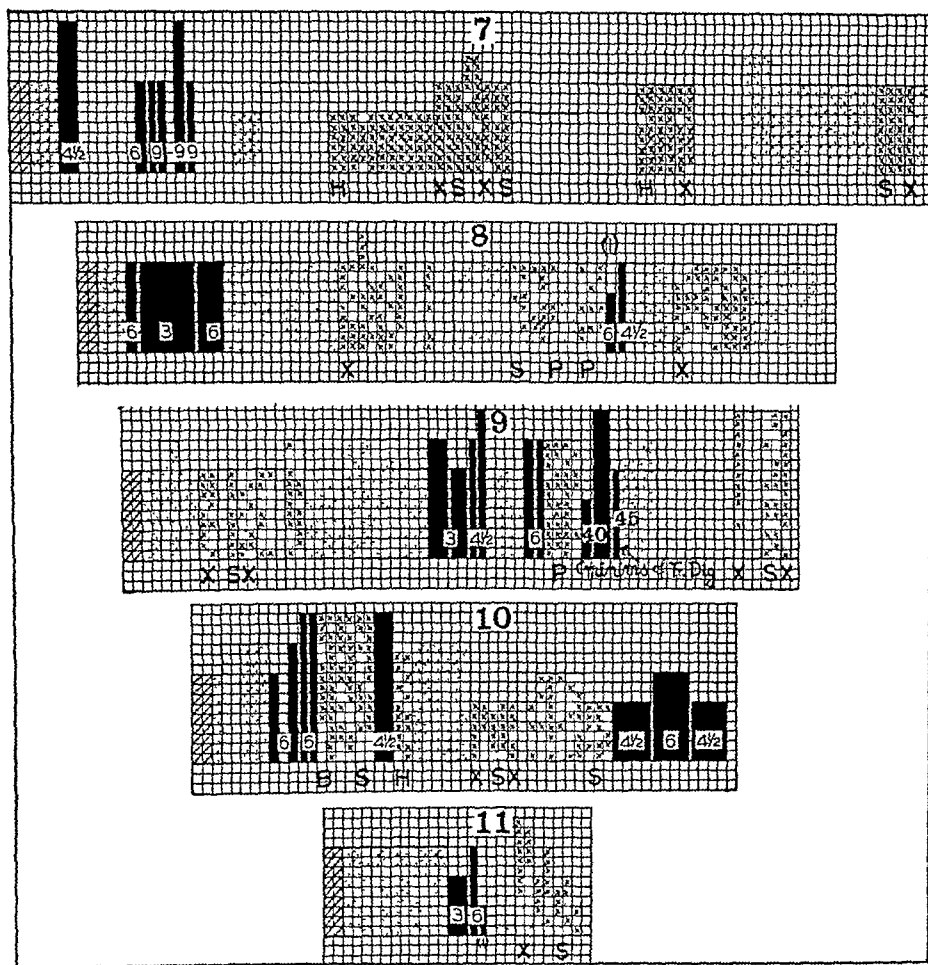


Chart 2—Course in cases 7 to 11

#### SUMMARY AND CONCLUSIONS

1 The effect of digitalis medication on cardiac pain was investigated in a series of 120 patients with angina pectoris.

2 The following criteria were used for the selection of these patients: evidence of organic heart disease; absence of signs of congestion; cardiac pain on effort; doing little or no physical work; and faithful cooperation.



CASE 3 (E H, a man, aged 50)—The diagnosis was arteriosclerosis, coronary thrombosis regular sinus rhythm and pain 1+. The duration of study was fifty-nine weeks

CASE 4 (A C, a woman, aged 45)—The diagnosis was hypertension and arteriosclerosis enlarged heart, coronary sclerosis, regular sinus rhythm and pain 2+. The duration of study was eighty-six weeks. In part of the period indicated in the chart (chart 1) by (1) the patient reduced the dose to 3 grains (0.2 Gm) because she believed that 6 grains (0.4 Gm) had increased the pain. This effect failed to reappear when the subsequent doses were even larger

CASE 5 (T E, a man, aged 70)—The diagnosis was arteriosclerosis, hypertension, enlarged heart regular sinus rhythm and pain 2+. The duration of study was sixty weeks

CASE 6 (J P, a man, aged 46)—The diagnosis was arteriosclerosis, coronary sclerosis regular sinus rhythm and pain 2+. The duration of study was sixty-six weeks. In the period indicated in the chart (chart 1) by (1), the patient also complained of dizziness and palpitation. In the period

pain 2+ The duration of study was twenty-five weeks. In the period indicated in the chart (chart 2) by (1) a placebo tablet was given with the digitalis

CASE 12 (P D, a man, aged 64)—The diagnosis was arteriosclerosis, hypertension, enlarged heart, aortic sclerosis, regular sinus rhythm and pain 2+. The duration of study was 119 weeks

CASE 13 (S R, a man, aged 69)—The diagnosis was arteriosclerosis and hypertension, enlarged heart, coronary sclerosis, regular sinus rhythm, severe secondary anemia and pain 3+. The duration of study was 159 weeks. Just prior to the period indicated in the chart (chart 3) by (1) a hemorrhoidectomy was performed, and during the long period that followed there was gradual improvement in the anemia. Note that in the period indicated by (2), while pain was very severe during the use of a daily dose of 6 grains (0.4 Gm) in tablet form, there was no pain when the equivalent in the form of a tincture was used even to the point of toxic symptoms (nausea and vomiting)

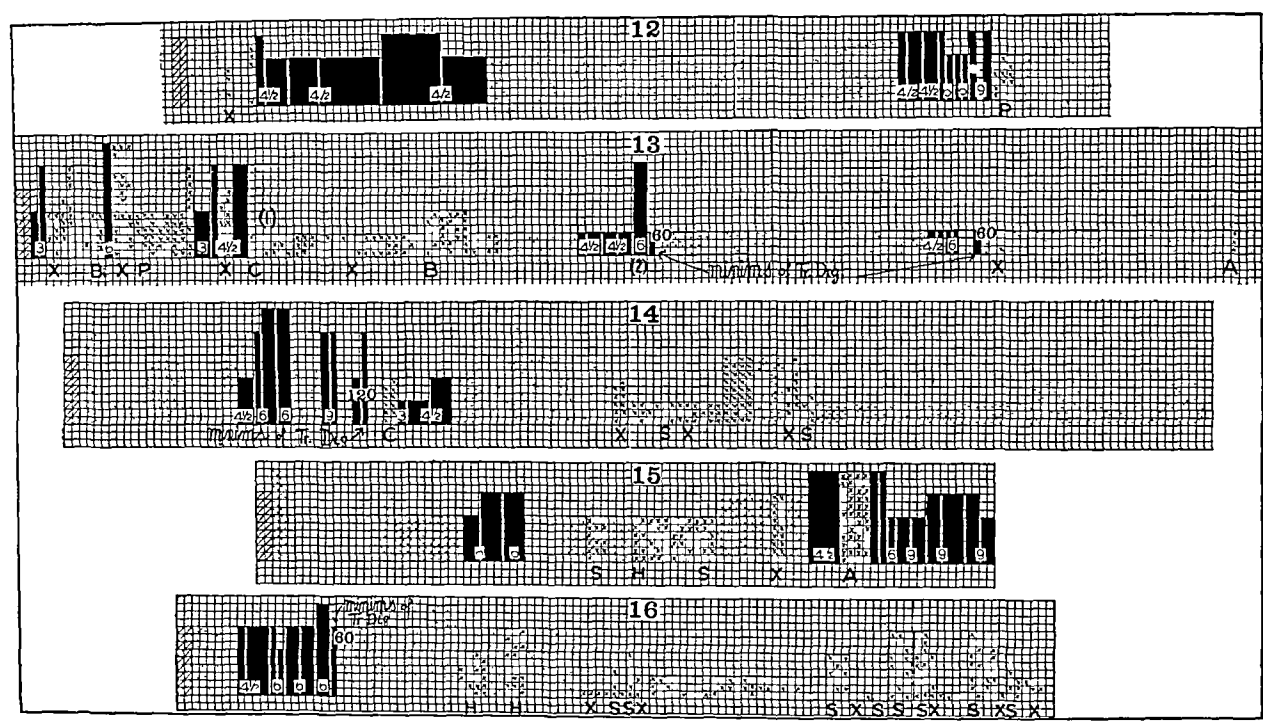


Chart 3—Course in cases 12 to 16

indicated by (2) the weather was cold, and the patient stated that he always felt worse in cold weather. In the periods indicated by (3) the weather was warmer

CASE 7 (M C, a man, aged 61)—The diagnosis was arteriosclerosis, coronary sclerosis, enlarged heart bundle branch block, regular sinus rhythm and pain 3+. The duration of study was ninety-four weeks

CASE 8 (S O, a man, aged 55)—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3+. The duration of study was seventy-six weeks. In the period indicated in the chart (chart 2) by (1) 18 grains (1.15 Gm) was given at one time and there was vomiting. Note that pain was not increased even at the toxic level

CASE 9 (M A, a man, aged 70)—The diagnosis was arteriosclerosis coronary and aortic sclerosis, regular sinus rhythm and pain 3+. The duration of study was sixty-eight weeks

CASE 10 (J M, a man, aged 67)—The diagnosis was arteriosclerosis enlarged heart, coronary sclerosis regular sinus rhythm and pain 2+. The duration of study was fifty-four weeks

CASE 11 (W J, a man, aged 42)—The diagnosis was arteriosclerosis coronary thrombosis, regular sinus rhythm and

CASE 14 (M G, a man, aged 56)—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3+. The duration of study was 146 weeks

CASE 15 (B G, a man, aged 58)—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3+. The duration of study was ninety-four weeks

CASE 16 (C E, a man, aged 68)—The diagnosis was arteriosclerosis enlarged heart, coronary sclerosis regular sinus rhythm with ventricular premature contractions and pain 3+. The duration of study was 111 weeks  
1300 York Avenue

**Spotted Fever in Canada**—This disease is endemic in southwestern Montana and the surrounding territory and is quite prevalent there and it has been recently reported from most of the United States. In 1923 it reached Manyberries Alta. Here twelve cases have occurred. Last year one of these came from 75 miles east, and according to Dr. F. C. Middleton director of the Provincial Board, was the first case reported to Regina. This seems to be the first invasion of Canada—Duncan J. H. Rocky Mountain Spotted Fever in Canada *Canad. M. A. J.* 37:575 (Dec) 1937

PREVALENCE, INCIDENCE AND TREND  
OF SYPHILIS IN CHICAGO

IN THE SPRING AND SUMMER OF 1937

LIDA J USILTON, MA

Statistician United States Public Health Service

HOWARD HUNTER, AB

Assistant Administrator Works Progress Administration  
AND

R A VONDERLEHR, MD

Assistant Surgeon General Division of Venereal Diseases United  
States Public Health Service

WASHINGTON, D C

The health authorities of the state of Illinois and the city of Chicago requested the United States Public Health Service to cooperate with the Works Progress Administration to determine the number of persons with syphilis actually under observation and treatment by all authorized medical sources of treatment in Chicago

TABLE 1—Patients Constantly Under Treatment and Observation in Chicago in 1937 (Rate per 10,000 of Population)

	White	Negro	Other Races	Total
Total patients	5,606	208		5,814
	Rate	Rate	Rate	Rate
Male	33	200	10	43
Female	24	213	100	43
Total	28	27	121	44

Every clinic cooperated in the survey. Private physicians furnished nonidentifying information about the patients with syphilis under their care. Of the 5,652 physicians in active practice in Chicago, 99.6 per cent cooperated in this undertaking.

The survey period selected was from March 1 to June 30, 1937. Every case record was included provided the patient had been in a clinic, hospital or institution or under the care of a private physician for treatment or observation for syphilis during the survey period, regardless of the time he first sought treatment for the infection. There were 19,000 records studied.

The survey has established

- 1 The number of patients actually under observation and treatment for syphilis by an authorized medical source in Chicago
- 2 The number of known fresh infections occurring annually in Chicago
- 3 The stage of syphilis at which patients seek treatment
- 4 The age of persons at the time of acquiring syphilis
- 5 The proportion of patients in each stage of syphilis who were untreated before seeking treatment for the particular manifestation detected on admission
- 6 The frequency of mucocutaneous (communicable) relapses
- 7 The effort that is made to detect neurosyphilis in the early stages so as to prevent the development of dementia paralytica

Under the direction of Thomas Parran, Surgeon General, United States Public Health Service.

Read before the South Chicago Branch and the Calumet Branch of the Chicago Medical Society, Dec. 14, 1937.

Mr. Arthur Carstens, Mr. Ethel E. Finn and Mr. Lawrence Linck supervised and helped the field force engaged in abstracting the data in this article. The success of the project was dependent largely on the earnestness, integrity and intelligence with which the following thirty-five senior medical students of the several universities of Chicago performed the field work: B. Abram, M. Albin, B. Bielin, C. Bond, J. Bowman, A. Carlson, H. Einhorn, R. Fort, I. Friedman, R. Frum, H. Fuqua, J. Gelfand, S. Gerber, R. Gradman, M. Grubman, D. Haflikow, M. Herzberg, E. Irons, H. Joffe, M. Kruglik, L. Moench, G. Osborne, M. Pearlman, M. Rosenthal, H. Rothenberg, O. Rukoff, R. Ryde, A. Sandor, B. Schaffer, L. Smith, C. Svare, G. von Ach, F. Walter, B. Weinberg and S. Wilcox.

8 The proportion of women with syphilis who receive sufficient treatment early in pregnancy to prevent the transmission of the disease to the child.

9 The results of pregnancy in terms of the stage of the mother's syphilis and the amount of antisyphilitic treatment given during pregnancy.

No effort has been made in this report to compare the incidence of syphilis in Chicago with that in other parts of the nation, although such data are available on request from the United States Public Health Service.

## PREVALENCE

The term prevalence, as used in this report, represents the number of persons under treatment for syphilis, day by day, by authorized medical sources.

There are 14,350 patients with syphilis constantly under medical care in Chicago. The rate for syphilis per 10,000 population is 44. Although the Negroes represent only 7 per cent of the population, the rates indicate that there is almost as much syphilis in this comparatively small group as there is in the entire white population of the city. In this study syphilis is shown to be eight and a half times as frequent in the Negro as in the white population (rate per 10,000 of population: 28 white and 237 Negro). This ratio of syphilis in the white and the Negro population is higher than has been found in most communities in which treatment facilities are accessible.

## INCIDENCE

The term incidence, as used in this report, represents the case rate or the number of new patients who seek treatment annually. Annual incidence is based on the number of new patients admitted during the four month period from March 1 to June 30, 1937.

In Chicago each year approximately 15,500 persons seek treatment for syphilis. Only 2,500 of these seek treatment during the early stages of the infection. Thus more than 84 per cent of the patients under treatment have failed to take advantage of the opportunity for "cure" that early and adequate treatment affords. It is interesting to note the ratio of incidence to prevalence. The incidence rate for syphilis per 10,000 of population is 47 and the prevalence rate 44. These

TABLE 2—Annual Attack Rate for Syphilis in Chicago in 1937 (Rate per 10,000 of Population)

	White	Negro	Other Race	Total
Total patients	8,094	7,123	211	15,428
	Rate	Rate	Rate	Rate
Male	33	295	177	3
Female	21	368	98	43
Total	27	202	123	41

rates indicate that patients remain under treatment for syphilis for approximately one year.

Since clinic and private patients, as is subsequently shown, average only twelve injections of arsphenamine with interim heavy metal therapy during the first two years, it is apparent that treatment is interspersed with long lapses which seriously interfere with its efficacy. Further evidence of neglect of therapy is the fact that only 23 per cent of the private patients who begin treatment during the early stage of syphilis continue until they have had the minimum amount (twenty injections of arsphenamine with appropriate heavy metal therapy) to render them noninfectious and to protect them re-

sonably well from the late manifestations of the disease. Approximately half of the patients with early syphilis under treatment in clinics receive the minimum required therapy before they lapse from treatment.

#### EFFECT OF THE SYPHILIS CAMPAIGN IN BRINGING EARLY SYPHILIS UNDER TREATMENT

The survey permitted a series of prevalence rates to be established at fifteen day intervals from March 1 to June 30. From chart 2 it will be observed that there was a persistent upward trend from March 1 to June

TABLE 3—Effectiveness of the Syphilis Campaign in Bringing Patients with Early Syphilis Under Authorized Medical Care

Patients with Early Syphilis	Physicians		Clinics		Increase	
	Num ber	Per centage	Num ber	Per centage	Total	Per centage
Prevalence (constantly under treatment)	538	26.0	1 547	73.5	2 105	
Incidence (new cases)	1 987	52.3	1 176	47.7	2 463	17

30. This upward trend was the result of an increase in the number of private patients seeking treatment for early syphilis. For every 100 patients with early syphilis under the care of the private physician on March 1, 1937, there were 126 patients on April 15

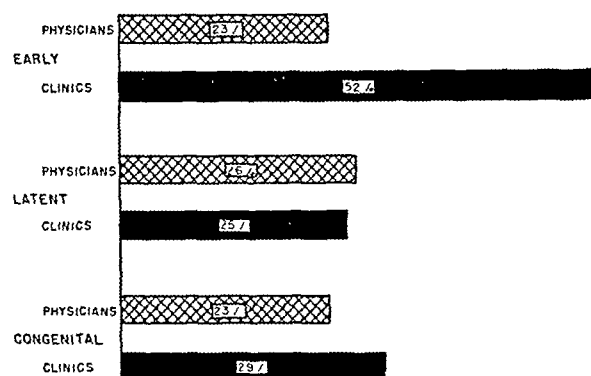


Chart 1—Proportion of patients who received the minimum required treatment by stage of syphilis on admission

and 146 patients on June 15. This remarkable trend is a tribute to those who have sought to awaken the public to a consciousness of syphilis and to make known the promise of "cure" that lies in early and adequate treatment. It did not exist for those patients who sought clinical care. It is apparent that the present campaign is reaching the middle economic group. The trend reveals the whole-hearted cooperation of the medical profession in Chicago in the present syphilis campaign.

It is interesting that the number of Negroes under treatment and observation for early syphilis has more than trebled. In other words, the response to pleas for early treatment has been greater in the racial group in which the infection is more frequent.

Further evidence of the awakened attention of the middle class to the need for early and adequate treatment is found in a comparison of the number of patients with early syphilis who were constantly under observation and treatment by the private physician with the number who sought treatment during the survey period. There was an increase of 17 per cent in the total number of the latter over the former. Chart 3

shows that 52 per cent of the patients with early syphilis who sought treatment during the survey period went to the private physician, in contrast with 26 per cent who were constantly under the care of private physicians. A 17 per cent increase in the number of persons with early syphilis who seek treatment cannot be interpreted as representing a fresh outbreak of the

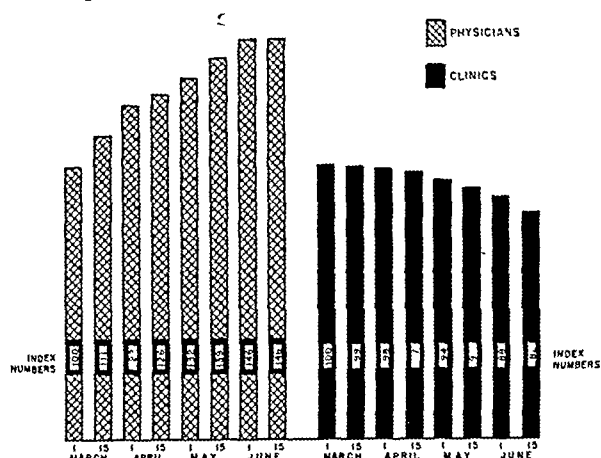


Chart 2—Patients with early syphilis under the care of physicians and clinics on indicated dates. Base index equals 100.

disease in a community in which 85 per cent of the previously infected population had neglected treatment until after the infection had reached the late stages.

#### RELATIVE FREQUENCY OF EACH STAGE OF SYPHILIS IN A GIVEN POPULATION

A standardized nomenclature for syphilis prepared by the Committee of Experts on Syphilis and Cognate Subjects of the Health Organization of the League of Nations was used in classifying the cases of syphilis in this survey. This nomenclature is based on the clinical manifestations of the disease. Its use permits a statement on the relative frequency of each stage of syphilis in the total population under treatment for the infection.

As shown by the 19,000 case records included in the study, 15 per cent of the patients were admitted with seronegative primary syphilis, 44 per cent with seropositive primary syphilis, 8 per cent with secondary

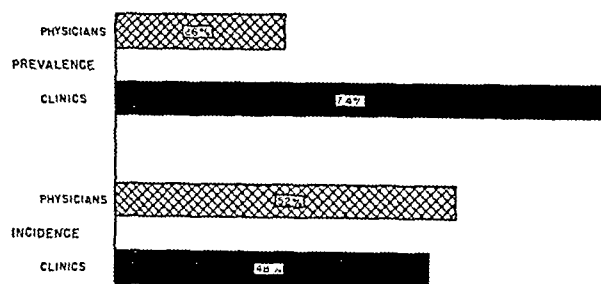


Chart 3—Proportion of patients with early syphilis by source of treatment at the beginning of the survey (prevalence) and at the termination of the survey (incidence).

manifestations in the first year, 106 per cent with early latent syphilis, 436 per cent with late latent syphilis, 5 per cent with cardiovascular syphilis, 3 per cent with asymptomatic neurosyphilis, 6 per cent with tabes dorsalis, 3 per cent with dementia paralytica and 7 per cent with congenital syphilis. In most of the cases of congenital syphilis the disease was not detected until after the third year of the child's life.

AGE INCIDENCE

Syphilis is contracted with the greatest frequency in early adult life. In fact, 59 per cent of the persons who acquired syphilis did so before they were 30 years of age.

The age incidence of persons with syphilis who are under the care of the private physician, as contrasted with those who are under the care of the clinic, is of

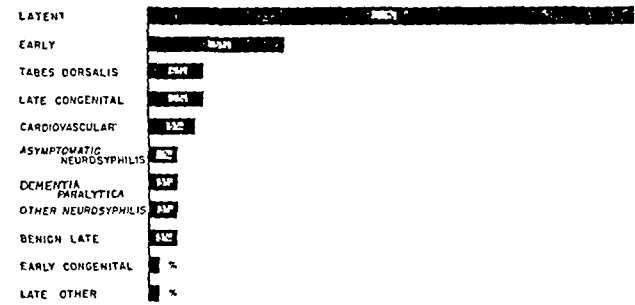


Chart 4—Percentage of the total number of patients under treatment by stage of infection on admission

interest. Sixty-four per cent of the patients under treatment at clinics and 45 per cent of the patients of private physicians acquire the infection before the age of 30. Neglect of treatment is probably somewhat dependent on the early age at which syphilis is acquired. Persons in the early age groups have not in many instances reached an earning capacity which enables them to pay even minimum private rates. The youthfulness of persons acquiring syphilis should make a strong appeal to those charged with maintaining the health of the nation.

EVIDENCE OF FAILURE TO DETECT AND TREAT SYPHILIS EARLY

Of approximately 11,400 patients under treatment and observation for late or latent syphilis in the clinics at any time during the survey period, 8,200, or 72 per cent, had had no prior treatment and only 6 per cent had had the minimum prescribed therapy. Of those with cardiovascular syphilis, 82 per cent had had no prior treatment. This high proportion of syphilis

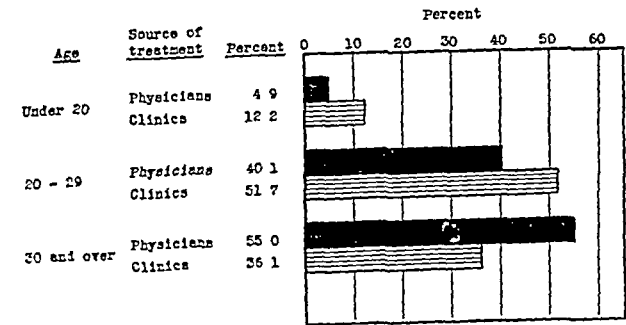


Chart 5—Percentage distribution of private and clinic patients by age at which the disease was acquired

remaining untreated during the infectious stage stresses the need for a more general use of the "Wassermann dragnet."

Important as it is to detect syphilis in the early stage, it is equally important that the patient receive the minimum required therapy before he is permitted to lapse. The machinery for holding such patients under treatment must be made more effective if syphilis is to be controlled. Undoubtedly many factors influence the

inability of physicians and clinics to hold patients under observation and treatment. An effort was made to determine some of these factors. A study of the distance a patient travels from his home to the nearest clinic was made. It was found that a round trip averages nine miles.

The study shows that of patients under the care of private physicians only 23 per cent receive sufficient arsphenamine with interim heavy metal therapy to prevent infectious relapse, whereas the clinic holds 52 per cent until they have received the minimum required treatment. The apparent greater willingness of persons with early syphilis to seek medical care from the private physician is associated with the greater difficulty of the private physician to hold patients or a sufficient proportion of them, until they are no longer a menace to the health of the community. It is pos-

TABLE 4—Relative Frequency of Each Stage of Syphilis on Admission for 19,071 Patients

Stage of Syphilis on Admission	Total Percentage
Seronegative primary	15
Seropositive primary	44
Secondary within first year	80
Secondary after first year	14
Latent, early (within 4 years of infection)	106
Latent, late (4 years or more after infection)	436
Late	
Skin and mucous membrane	24
Visceral	03
Cardiovascular	
Unspecified	11
Uncomplicated aortitis	29
Aortic regurgitation	05
Myocarditis	03
Coronary sclerosis	01
Aneurysm	04
Myocardial failure	03
Bone and joint	03
Neurosyphilis	
Asymptomatic	30
Meningeal	02
Vascular	05
Meningovascular	08
Dementia paralytica	32
Optic atrophy	04
Tabes dorsalis	56
Other unclassified	13
Ocular	04
Congenital, early	
Within first week	004
1 week to 6 months	06
6 months to 3 years	06
Congenital, late	
3 years and over	60
Total	1000

sible that the clinics make better use than do the physicians of the machinery provided by the local health service for returning to treatment patients who have lapsed. The nominal fee for treatment in clinics may be an important factor in holding medically indigent patients until adequate treatment has been administered. The physician is able to hold a good proportion of the patients with late manifestations of syphilis until they have received adequate therapy. Although adequate treatment for these patients is highly desirable, it is not the paramount issue in the prevention and control of syphilis.

The study reveals that neither the clinic nor the physician has succeeded in giving the patients an average of more than twelve injections of arsphenamine with interim heavy metal therapy within the all-important first two years of treatment and observation. Further, more 67 per cent of the physicians' patients and 44 per cent of the clinics' patients who are no longer under treatment disappear in the first two years. Patients in

the group "no longer under treatment" include those who have not been seen at the source of treatment for sixty days or more. It is noted that the twelve injections have increased to fifteen injections of arsphenamine with appropriate heavy metal therapy in the same treatment-observation period for patients "still under treatment." This fact indicates some improvement in the prevention of lapses from treatment. Chart 7 shows the rapid disappearance of physicians' patients from treatment and observation and the limited number of patients who remained long enough to receive an adequate amount of treatment to insure the maximum benefits.

FREQUENCY OF MUCOCUTANEOUS RELAPSE

A mucocutaneous (communicable) relapse occurred in 53 per cent of the patients with early syphilis. This emphasizes the need for preventing lapses from treatment before the patient is definitely rendered noninfectious. Mucocutaneous relapses have a serious public health import because they occur at a time when an inadequately treated patient is no longer conscious of his syphilis and therefore becomes a dangerous and hidden source in the spread of the disease. This point is emphasized because of the large number of persons

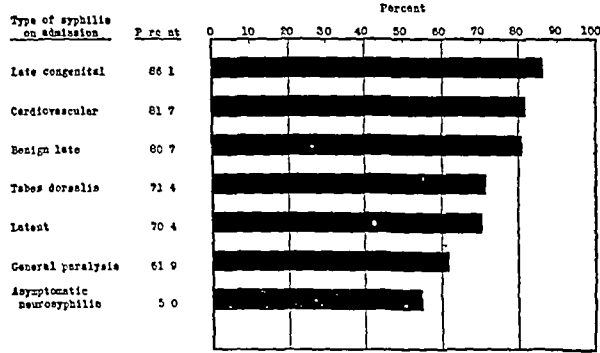


Chart 6—Type of syphilis on admission to clinics showing the percentage of patients previously untreated

with early syphilis who fail to receive the minimum amount of treatment required to render them permanently noninfectious.

SOURCE OF TREATMENT

A study was made of the distribution of the white and Negro patients with syphilis under treatment any time during the survey period by physicians and various types of clinics. Thirty-four per cent of the patients were treated in free tax-supported clinics, 25 per cent by private physicians, 18 per cent in free or part pay clinics supported by private funds, 12 per cent in part pay clinics supported by taxes and private funds and 11 per cent in full-pay clinics supported wholly by private funds. A preponderance of the Negroes were treated in free, tax-supported clinics. The full-pay clinics supported by private funds had the smallest proportion of Negro clientele.

DISTRIBUTION OF PATIENTS UNDER PRIVATE CARE

Of the 5,652 physicians in active practice in Chicago, 1,510 reported one or more patients with syphilis under observation and treatment. Of the private patients 51 per cent were under the care of physicians who had only from one to four patients with syphilis. A group of specialists representing 1 per cent of the physicians in Chicago had 24 per cent of the private patients with syphilis.

SIGNIFICANCE OF THE BLOOD TEST IN PROGNOSTICATING CLINICAL PROGRESSION OR RELAPSE

A study was made of the significance of the positivity of the blood or serologic test on the termination of treatment in terms of clinical progression and relapse. Of the 9,719 patients who had a positive serologic reaction 285, or 3 per cent, experienced a clinical relapse. Of 3,791 patients who had a negative reac-

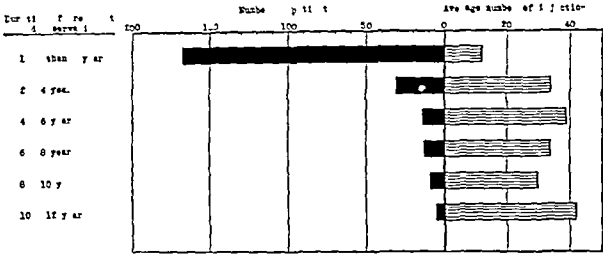


Chart 7—Number of patients treated and observed by physicians for the indicated length of time showing the average number of injections of arsphenamine received

tion of the blood, 4 per cent experienced a clinical relapse. A review was made of the severity of the clinical manifestations in the two types of patients. It was found that they did not vary significantly. Thus, the reaction of the blood was an inefficient guide to the ultimate clinical outcome.

The effect of therapy was also evaluated with the arsenical drug as the index. It is significant that in some cases seventy or more injections of arsphenamine with interim heavy metal therapy failed to reverse a persistently positive reaction, in a few cases as many as 180 injections of arsphenamine and 460 injections of bismuth compounds were not effective.

FAILURE TO EXAMINE THE SPINAL FLUID

It was found that no institution or clinic in Chicago was making examinations of the spinal fluid as a routine for all patients. On the average, 70 per cent of the patients had no such examination. This percentage varied from clinic to clinic. Only a few clinics were so examining as many as half of the patients with latent or late syphilis. Practically none of them made a significant number of examinations of the spinal fluid for patients with early syphilis. Such examina-

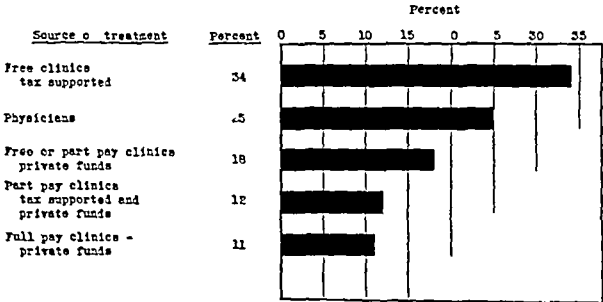


Chart 8—Percentage distribution of patients by source of treatment, figures based on all patients treated by physicians and clinics in the survey period

tions were made more frequently for patients with negative reactions of the blood than for patients with positive reactions.

A higher proportion of the examinations of the spinal fluid were made for the white patients in clinics than for the Negroes. Of 11,400 persons to whom

no previous treatment had been administered, 1,100 (10 per cent) had a negative reaction of the blood on admission. Of these patients, 15 per cent had a positive reaction of the spinal fluid despite the fact that the spinal fluid of only a third of the total number of patients was examined.

the inadequate control of syphilis in pregnancy in Chicago clinics was the fact that of those pregnant women in whom syphilis was detected before the fifth month, only 21 per cent persisted in treatment through out pregnancy or until they had received sufficient treatment to assure the birth of a living nonsyphilitic infant.

TABLE 5—Stage of Syphilis on the Patient's Admission to the Clinic and the Amount of Antisyphilitic Treatment Received Prior to Admission

Stage of Syphilis on Admission	Amount of Antisyphilitic Treatment Received Prior to Admission								Total
	None		Heavy Metal Therapy Only		Less Than 20 Injections of Arspenamine with Heavy Metal Therapy		More Than 20 Injections of Arspenamine with Heavy Metal Therapy		
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
Early acquired	1 711	8° 9	20	1 0	255	13 9	24	1 2	2 010
Early congenital	194	89 8	3	1 4	17	7 9	2	0 9	216
Latent	5 205	70 4	268	3 6	1 510	20 5	403	5 5	7 386
Benign late	348	80 7	15	3 5	51	11 8	17	4 0	4 11
Cardiovascular	558	81 7	21	3 1	88	12 9	16	2 3	683
Asymptomatic neurosyphilis	257	55 0	14	5 0	115	24 6	81	17 3	467
Tabs dorsalis	558	71 4	27	3 4	123	15 7	74	9 5	782
Dementia paralytica	143	61 9	9	3 9	54	23 4	25	10 8	231
Other neurosyphilis	251	73 2	16	4 7	44	12 8	32	9 3	343
Other late (ocular and visceral)	116	87 2			13	9 8	4	3 0	133
Late congenital	694	86 1	15	1 5	67	8 3	33	4 1	806
Stage not reported	104	87 4	2	1 7	13	10 9			119
Total	10 159	74 3	407	3 0	2 359	17 5	711	5 2	12 646

\* This total represents all patients under treatment by clinics at any time during the survey period.

PREGNANCY

In the clinics there were 6,500 women over 16 years of age with syphilis. Of these 11 per cent became pregnant after infection with syphilis. All of these women received some antisyphilitic therapy during pregnancy.

The proportion of stillbirths for women who did not have syphilis was compared with the proportion for

A complete evaluation of the effectiveness of treatment in terms of outcome of pregnancy for the syphilitic women in Chicago clinics was seriously impaired by failure to examine the child in half the cases.

The material was divided between those pregnant women with syphilis who were delivered prior to 1936 and those who were delivered after this date. Unfortunately, a comparison between these two groups fails to indicate that any higher proportion of pregnant

TABLE 6—Average Number of Injections of Arspenamine Administered to Patients During the Treatment-Observation Period According to Sources of Treatment \*

Duration of Treatment and Observation for Syphilis, Years	Still Under Treatment				No Longer Under Treatment			
	Physicians		Clinic		Physicians		Clinic	
	Number of Patient	Average Number of Injections	Number of Patients	Average Number of Injections	Number of Patients	Average Number of Injections	Number of Patients	Average Number of Injections
Less than 2	2 651	15	4 751	15	168	12	401	12
2 to 4	395	39	1 861	27	51	1	256	24
4 to 6	106	45	581	46	14	5	153	50
6 to 8	72	55	412	37	15	24	89	25
8 to 10	41	47	165	44	9	50	25	5
10 to 12	32	55	65	41	5	42	12	61
12 and over	91	50	60	55	10	51	22	43
Total	3 391	21	8 175	31	250	20	1 052	22

\* Patients who did not receive any arspenamine or were given an unknown amount are omitted.

those who had syphilis. It was found that only 2 per cent of the pregnancies of nonsyphilitic women result in stillbirths, as compared with 10 per cent for those with syphilis. This percentage of disastrous outcomes of pregnancy in syphilitic women was reduced to 5 per cent or less, depending on the amount of antisyphilitic treatment that was given the mother during pregnancy. It has been reported that treatment begun before the fifth month of pregnancy is most effective in obtaining a live nonsyphilitic infant. However, syphilis had not been detected in at least half of the syphilitic pregnant women before the fifth month. Further evidence of

women begin treatment before the fifth month of pregnancy or that any greater proportion of those who do are persisting with treatment until they have received a sufficient amount to prevent the transmission of the disease to the child.

SUMMARY

The health authorities of the state of Illinois and the city of Chicago requested the United States Public Health Service to cooperate with the Works Progress Administration to determine the number of persons with syphilis under treatment and observation by all authorized medical sources in Chicago. Every clinic

and 99.6 per cent of the physicians in active practice cooperated in this undertaking.

There are 14,350 patients with syphilis constantly under medical care in Chicago (rate per 10,000 of population, 44). Syphilis is eight and five-tenths times more frequent in the Negro than in the white population (rate per 10,000 of population, 237 Negro and 28 white).

Approximately 15,500 persons with syphilis seek treatment annually (rate per 10,000 of population, 47). Only 2,500 of the 15,500 are in the early stage.

Of those who do seek treatment for syphilis in the early stages, only 23 per cent of the private patients and 52 per cent of the clinic patients receive the minimum effective therapy before they disappear from observation.

A series of prevalence rates, established at fifteen day intervals from March 1 to June 30, showed that for every 100 patients with early syphilis under the care of private physicians on March 1 there were 126

Of the patients with cardiovascular syphilis, 82 per cent had had no treatment prior to the detection of this manifestation.

Mucocutaneous relapse occurred in 53 per cent of the patients with early syphilis.

Of the 5,652 physicians in active practice in Chicago, 1,510 reported one or more patients with syphilis under observation and treatment. A group of specialists representing 1 per cent of the physicians in Chicago had 24 per cent of the private patients with syphilis.

Of the 9,719 patients who had a positive serologic reaction on the termination of treatment, 3 per cent experienced a clinical progression or relapse. Of 3,791 patients with a negative reaction of the blood on the termination of treatment, 4 per cent experienced a clinical progression or relapse.

In some cases seventy or more injections of arsphenamine with appropriate heavy metal therapy failed to reduce a persistently positive reaction, in a few cases as many as 180 injections of arsphenamine and 460

TABLE 7—Percentage of Patients Treated by Private Physicians and in Various Types of Clinics at Any Time During the Survey Period According to Race and the Stage of Syphilis on Admission

Stage of Syphilis on Admission	Treated in Various Types of Clinics												
	Number of Patients			Treated by Physicians	Free Tax Supported		Part Pay Tax and Private Funds		Full Pay Private Funds		Free or Part Pay Private Funds		
					White Per centage	Negro Per centage	White Per centage	Negro Per centage	White Per centage	Negro Per centage	White Per centage	Negro Per centage	
	Total	White	Negro	White Per centage	Negro Per centage	White Per centage	Negro Per centage	White Per centage	Negro Per centage	White Per centage	Negro Per centage		
Early	2,824	1,639	1,185	40	14	21	71	8	5	21	4	10	6
Latent	9,791	5,100	4,691	39	11	21	63	9	12	16	3	15	11
Benign	498	302	196	19	5	19	51	14	20	11	3	37	21
Cardiovascular	812	412	400	39	5	10	31	5	30	16	3	30	31
Asymptomatic neurosyphilis	563	419	144	20	10	12	45	13	8	34	18	21	19
Tabs dorsalis	990	789	201	28	3	13	29	7	51	23	4	29	13
Dementia paralytica	323	281	42	32	17	16	36	11	21	20	2	21	24
Other neurosyphilis	639	387	252	49	10	7	46	6	26	13	2	25	16
Other late (ocular and visceral)	153	84	69	21	7	12	42	37	32	6		24	19
Early congenital	222	135	87	6	2	3	28	7	22	4		80	48
Late congenital	957	690	267	20	5	11	29	14	25	9	1	43	40
Stage not reported	118	66	52	21	2	20	54	30	38	20		9	6
Total	17,840*	10,484	7,356	35	10	15	58	10	15	17	3	20	14

\* There were 321 patients of races other than the white and the Negro race who were omitted from this table.

patients on April 15 and 146 patients on June 15. This upward trend did not exist for those patients with early syphilis who sought clinic care.

There was an increase of 17 per cent in the total number of persons with early syphilis who sought treatment during the survey period over those constantly under observation and treatment.

Fifty-two per cent of the persons who sought treatment for early syphilis during the survey period came to the private physician, in contrast with 26 per cent of the patients with early syphilis who were constantly under the care of private physicians.

The use of a uniform nomenclature in abstracting the cases under treatment permits a statement on the relative frequency of each stage of syphilis in a given total population.

Fifty-nine per cent of those who acquire syphilis do so before the age of 30 years.

Sixty-four per cent of clinic patients, as contrasted with 45 per cent of patients under the care of private physicians, acquire their infection before the age of 30.

Of approximately 11,400 clinic patients with late or latent syphilis seen any time during the survey period, 72 per cent had had no prior treatment and only 6 per cent had had the minimum prescribed therapy.

injections of a bismuth preparation were not effective. In no institution or clinic in Chicago are examinations of the spinal fluid done for all patients. On the average 70 per cent of the patients had no such examination. In only a few clinics were half the patients with late or latent syphilis examined.

In the clinics there were 6,500 women over 16 years of age with syphilis. Of these, 11 per cent became pregnant after acquiring syphilis.

Fifteen per cent more of the mothers under 30 than of the mothers over 30 were delivered of living infants.

Among nonsyphilitic women, 2 per cent of the pregnancies result in stillbirths, among those with syphilis, 10 per cent. Treatment of the syphilitic mother during pregnancy reduces the percentage of stillbirths to 5 per cent or less.

In half of the women syphilis was not detected until after the fifth month of pregnancy. Of those in whom it was detected before the fifth month, only 21 per cent persisted in treatment throughout pregnancy or until they had received sufficient treatment to insure the birth of a living nonsyphilitic infant.

A complete evaluation of the effectiveness of the treatment of pregnant syphilitic women in Chicago clinics was seriously impaired by failure in half the instances to examine the child.



## CALCIUM METABOLISM AND TEETH

ISAAC SCHOUR, DDS, PH D

CHICAGO

A number of important problems arise in the daily practice of dentistry that are related to the calcification of the teeth. These include the effects of pregnancy on the teeth of the mother, prenatal and postnatal calcification, the influence of the endocrine organs, the effects of dietary factors, mottled enamel, caries and the question of withdrawal of calcium from teeth.

## NORMAL CALCIUM METABOLISM

An intelligent answer to any of these questions requires an understanding of the normal processes. Yet it appears that the normal processes cannot be understood until the valuable clues that come from pathologic and experimental studies have been obtained. Claude Bernard,<sup>1</sup> the father of experimental medicine, pointed out that disease is nature's experiment to cope with an abnormal condition. If there is recovery, nature's experiment is successful. Significant information has come and will come from careful observation of nature's methods of combating diseases which are experimentally produced and carefully controlled.

To discuss properly the question of the calcification of the teeth, it is necessary to review at least briefly the factors that are involved in calcification in general. The tooth does not form and calcify merely as an entity in itself but rather as a part of the body. The tooth is therefore subject, with of course some modification, to the same physical and chemical laws as the bones.

The calcium which is present in one's daily food is absorbed through the intestinal tract, whence it is carried into the blood stream. Calcium is present in the food in both organic and inorganic forms. It is probable that the organic must be converted to the inorganic form in the alimentary tract prior to being absorbed. Absorption of calcium occurs mainly in the upper regions of the small intestine.

The reaction of the intestinal contents is an important factor in the absorption of calcium, its salts being soluble in acid and insoluble in alkaline mediums. Foods which increase the acidity of the intestine favor solution of calcium. Sugars, especially lactose, which yield organic acids and consequently lower the  $pH$  of the intestinal contents, favor absorption of calcium. An excess of fat in the diet is said to reduce the absorption of calcium as the result of formation of insoluble calcium soaps. A high phosphorus content in the diet also reduces the absorption of calcium, calcium phosphate being only slightly soluble.

Sherman and Hawley,<sup>2</sup> in studies on children, found that the calcium of different foods is not equally absorbed, the calcium of milk being well utilized and that of certain vegetables poorly utilized.

After ingestion of large doses of soluble calcium salts, the serum calcium level rises. It reaches its maximum in about two hours; the normal level is reached again about three hours later. It is not possible to maintain

the calcium level above normal by administration of massive doses of soluble calcium salts. This belief is based on the finding of large amounts of calcium in the feces. During a fast a considerable amount of calcium appears in the feces. This experimental fact proves that calcium is excreted continuously into the bowel independently of the calcium intake. The excretion occurs mainly through the wall of the bowel. Smaller amounts of calcium are excreted in the urine. Sherman and Hawley<sup>3</sup> found that children from 3 to 13 years of age receiving from 0.74 to 1.02 Gm of calcium daily retained from 0.15 to 0.62 Gm a day.

The calcium balance, i. e., the difference between the quantity of calcium ingested and that excreted in the feces and urine, is positive during growth, pregnancy and acromegaly or after a period of calcium starvation. The calcium balance is negative during infantile rickets, celiac or renal rickets, sprue, osteomalacia, hyperparathyroidism, hyperthyroidism, calcium deficiency (starvation) and, usually, lactation.

*Calcium in the Blood*—In the blood the amount of calcium is a physiologic constant. In the human being, as in most animals, its concentration ranges between 10 and 11 mg per hundred cubic centimeters of serum. Many theories have been expounded in regard to the state in which calcium occurs in the blood. According to McLean and Hastings,<sup>4</sup> of the 10 mg of calcium present in the hundred cubic centimeters of blood serum, 5 mg is in the form of nondiffusible calcium bound to protein and practically 5 mg is in the form of diffusible ionized calcium ( $Ca^{++}$ ). They said that this diffusible ionized calcium is of "primary physiologic and clinical importance."

The calcium ion concentration in the blood is kept constant mainly by the action of the parathyroid secretions on the calcium which is in organic combination. When these are absent or deficient, as in the case of experimental parathyroidectomy, the calcium ion concentration is reduced from 5 mg to 1.5-4 mg per hundred cubic centimeters. In clinical and experimental hyperparathyroidism, the calcium ion concentration is raised from 5 to 5.5-8 mg.

The organism is protected against too sudden changes in the concentration of ionized calcium, first, by the reserve supply of calcium available in the blood calcium that is bound to protein<sup>4</sup> and, secondly, by the great reserve supply in the bones.

*Calcium in the Bones*—Ninety-nine per cent of the calcium in the body is present in the skeletal system, presumably in the form of normal calcium orthophosphate and calcium carbonate. This calcium is in equilibrium with the blood calcium, so that the latter can be kept at a constant concentration by a shift of calcium from the bones to the blood or from the blood to the bones. The bones are constantly resorbed and rebuilt, and within normal limits they take in additional calcium readily and give up calcium just as readily. Calcification and withdrawal of calcium are continuous every day physiologic experiences of bone. Foote<sup>5</sup> has given this simple comparison: "As a banking institution receives money from depositors and holds it subject to check, so bone receives deposits of calcium salts from the different foods and pays them out on demand."

From the Department of Histology, University of Illinois College of Dentistry.

<sup>1</sup> Bernard, Claude. *An Introduction to the Study of Experimental Medicine*, translated by N. C. Greene and L. J. Henderon. New York: Macmillan Company, 1927.

<sup>2</sup> Best, C. H., and Taylor, N. B. *The Physiological Basis of Medical Practice*. Baltimore: William Wood & Co., 1937.

<sup>3</sup> Sherman, H. C., and Hawley, E. Calcium and Phosphorus Metabolism in Childhood. *J. Biol. Chem.* 33: 75 (Aug.) 1922.

<sup>4</sup> McLean, F. C., and Hastings, A. I. Clinical Estimation and Significance of Calcium Ion Concentration in the Blood. *Am. J. M. Sc.* 159: 601 (May) 1935.

<sup>5</sup> Foote, J. S. Bone as a Measure of Development. *When and How We Acquired our Teeth*. Omaha: Press-Douglass Printing Company, 1924.

*Calcification of the Teeth*—The teeth are much more highly specialized than are the bones. While the bones are constantly decalcified and recalcified, the teeth undergo practically all of their calcification in an early period of their life cycle. They experience only a limited amount of subsequent secondary calcification and are not subject to withdrawal of calcium. Disturbances in calcification therefore influence only the growing tooth, that is, the tooth of the infant and child. The adult tooth, which is already fully formed, calcified and erupted, is not influenced by systemic disturbances in calcification. Failure to distinguish between the growing and the fully formed adult tooth has caused a great deal of unnecessary controversy and misunderstanding. A more detailed discussion of the calcification of the teeth is presented in the section on "Calcium Metabolism and the Growing Tooth."

#### CALCIUM METABOLISM AND THE ADULT TOOTH

When one examines the data on calcium metabolism that are available in regard to the adult tooth one finds mainly negative correlations. No evidence has yet been presented to show that teeth are subject to withdrawal of calcium. This simple fact has for the most part not been recognized by the dental and the medical professions. Both professions have carelessly regarded the teeth as a storehouse of calcium and have thus permitted the general acceptance of serious misconceptions. The addition of supplements of calcium to a so-called adequate diet has often been suggested and stressed as a preventive or a means of arrest of dental caries in the adult. Mothers have been warned that they would lose a tooth for every child unless they ingested sufficient additional calcium to prevent the loss of calcium from their teeth. This warning implied a provident gift of nature to conserve at least in part the dental apparatus by sacrificing only one particular tooth at a time instead of depleting a little from every tooth.

The question of withdrawal of calcium from the teeth is therefore sufficiently important to justify a brief review of the literature. Nearly two thousand years ago, Galen considered the teeth as bits of bone. In the sixteenth century, Eustachius<sup>6</sup> disproved this view and showed that the teeth are cutaneous appendages. Two hundred years later, with the rise of the science of physiology and the employment of the experimental method, John Hunter<sup>7</sup> conducted experiments with madder. He found a red coloration only in the tissues that were calcifying during the feeding of madder. In the animal that was allowed to live weeks after the feeding of madder, the red coloration disappeared from the bone but did not disappear from the dentin. Hunter therefore concluded that there is a vital difference between bone and dentin and that bone can be resorbed and its calcium withdrawn while dentin does not show such capacity. In this connection he also pointed out the absence of vascular paths by which calcium might be withdrawn from the dentin.

Strong negative evidence showing that teeth do not constitute a reserve supply of calcium has come from recent clinical studies on hyperparathyroidism. Thoma<sup>8</sup> made a histologic study of two premolars and one molar obtained from a boy 15 years of age who

had a parathyroid tumor, a condition which is known to decalcify bone. He found no evidence of resorption in the teeth.

Albright, Aub and Bauer<sup>9</sup> examined the roentgenograms of jaws of patients who had parathyroid tumors and showed marked withdrawal of calcium from the bones. They concluded:

The teeth do not take part in the generalized decalcification. They may fall out because of disease of the jaws but they themselves remain well calcified. This is brought out strikingly by roentgenograms in which the well calcified teeth stand out sharply against the poorly calcified jaws. This failure of the teeth to become decalcified is strong evidence against their being a reserve supply of calcium.

In an analysis of experimental hyperparathyroidism produced in normal rats by multiple injections of parathyroid extract, Schour, Tweedy and McJunkin<sup>10</sup> found evidence of withdrawal of calcium from the alveolar bone. This bone showed prominent osteoclastic activity. The molars as well as the incisors which could be seen in the same fields showed no osteoclasts or loss of calcium.

In a recent experimental study of the changes in the incisor of the rat following parathyroidectomy, the most severe histopathologic changes were found in series of parathyroidectomized rats that were subjected to repeated pregnancies and lactations (Schour, Chandler and Tweedy<sup>11</sup>). The much greater drain on calcium than would be obtained by parathyroidectomy alone was probably chiefly responsible for the more severe reaction. The experiments indicate that the severe reaction in the incisor resulted because much less calcium was available to the growing and calcifying tooth than would have been available under the condition of parathyroidectomy alone. If withdrawal of calcium were responsible for the disturbed calcification in the incisor, a similar disturbance should be recognizable in the molars. The latter showed normal calcification because they had completed their formation and calcification before or soon after parathyroidectomy.

The facts found in previous investigations harmonize with Erdheim's<sup>12</sup> calcioprotective law. According to this law, disturbances in calcium metabolism do not affect the various tissues of the body to an equal extent. Some tissues are less readily disturbed than others and possess a greater degree of protection against disturbances in calcification. Dentin and enamel thus are protected against loss of calcium.

*Secondary Dentin and Secondary Calcification*—Lest it be thought that the dentin of the adult tooth is not subject to any change, it must be pointed out that it is capable of reacting to stimuli and injuries from without by means of formation of secondary dentin or sclerosis (Beust<sup>13</sup>) and of becoming more densely calcified with age (secondary calcification). Fish<sup>14</sup> has described the constant occurrence of an imper-

<sup>9</sup> Albright, Fuller, Aub, J. C. and Bauer, Walter. Hyperparathyroidism: A Common and Polymorphic Condition as Illustrated by Seventeen Proved Cases from One Clinic. *J. A. M. A.* **102**: 1276 (April) 1934.

<sup>10</sup> Schour, Isaac, Tweedy, W. R. and McJunkin, I. A. The Effect of Single and Multiple Doses of the Parathyroid Hormone on the Calcification of the Dentin of the Rat Incisor. *Am. J. Path.* **10**: 321-342 (May) 1934.

<sup>11</sup> Schour, Isaac, Chandler, S. B. and Tweedy, W. R. Changes in the Teeth Following Parathyroidectomy. I. The Effects of Different Periods of Survival, Fasting and Repeated Pregnancies and Lactations on the Incisor of the Rat. *Am. J. Path.* **13**: 945-970 (Nov.) 1937.

<sup>12</sup> Erdheim, J. Rachitis und Epithelkörperchen. *Denkschr. d. Akad. d. Wiss. ch. math. naturw. Klasse* **80**: 363-688, 1914.

<sup>13</sup> Beust, T. B. Reaction of the Dental Pulp to External Irritation. *J. Am. Dent. A.* **18**: 1060 (June) 1931.

<sup>14</sup> Fish, E. W. The Pathology of the Dentin and the Dental Pulp. *Brit. Dent. J.* **53**: 351-363, 1912.

<sup>6</sup> Eustachius, cited by Eidmann, Hermann. Die Entwicklungsgeschichte der Zähne des Menschen. Berlin: H. Meuser, 1923.

<sup>7</sup> Hunter, John. Natural History of the Human Teeth, 1771 and Pathology of the Teeth, 1778. in Otley, Drewry. The Life and Works of John Hunter. Philadelphia: Hoswell, Barrington and Hoswell, 1839.

<sup>8</sup> Thoma, Kurt H. Clinical Pathology of the Jaw. Springfield, Ill.: Charles C. Thomas, Publisher, 1934.

meable barrier of lime salts between a peripheral lesion of the dentin and the pulp. This calcific barrier is either a translucent zone of hypercalcified dentin immediately below the lesion first described by Tomes<sup>15</sup> or secondary dentin, which Fish regards as a calcific scar laid down at the pulpal margin to seal off a tract of injured and dead tubules.

**Pathologic Calcification**—A number of alterations in calcification are associated with the teeth and their investing tissues, and they present interesting problems for investigation. These pathologic calcifications in many instances show typical Liesegang ring phenomena that are similar to those observed in the normal calcification of the dentin matrix (fig 1). In a recent study on salivary calculus of the submaxillary gland, Berger and Berke<sup>16</sup> pointed out that Liesegang rings were observed in the central portions of the calculi and that the outer crust consisted of concentric layers of calcified substance closely resembling that of cortical bone. These authors also stated that the histologic picture seen in coronal calculus is similar to that observed in the submaxillary gland.

The calcification of the so-called false denticles of the pulp also occurs along a pattern resembling that of the Liesegang rings. They are formed by a concentric deposition of consecutive layers of calcium salts around a central nucleus which frequently is the result of hyaline degeneration of an area of the pulp.<sup>17</sup> Concentric bodies of calcification which are found occasionally at the distal pulpal slit of the rat incisor and increase in number and size after parathyroidectomy (fig 2) and hypophysectomy also appear to exhibit the Liesegang ring phenomena. Pathologic calcification of

is more susceptible to decay. That faulty calcium metabolism produces defectively calcified structures in growing teeth is well established both clinically and experimentally. There is, however, no evidence that the quality of the calcified structure of the tooth has a significant role in the incidence of caries.

Weaver<sup>18</sup> pointed out the interesting fact that in school children a large proportion of second deciduous molars are carious on the mesial surface at the age of 5,

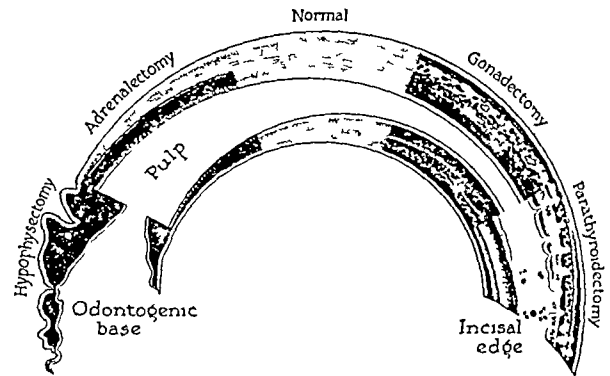


Fig 2—A composite diagram of the different levels of the labial (convex) and the lingual (concave) portion of the dentin of the incisor of the white rat. The labial and the lingual dentin are separated in the center by the pulp. The sections indicate the characteristic disturbances in the formation and the calcification pattern of the dentin in particular endocrine dysfunctions. This diagram shows the kymographic quality of the dentin. The changes in gonadectomy were found only in the ground squirrel.

while at that age caries is rare on the distal surface of the same tooth. This striking difference in relative liability to caries of the mesial and the distal surface of the same tooth cannot be explained on the basis of a difference in structure. Weaver traced the difference in reaction to a difference in the opportunity for stagnation of carbohydrate. The contact point between the first and the second deciduous molars is favorable for stagnation while prior to the eruption of the first permanent molar the distal surface of the second deciduous molar is exempt from stagnation.

The investigations of Black,<sup>19</sup> Turkheim,<sup>20</sup> Kanthak<sup>21</sup> and Arnim<sup>22</sup> do not support the view of Mellanby<sup>23</sup> that defective structure is a primary cause of caries. Mottled enamel, which is a structural and chemical defect, shows no special susceptibility to caries.<sup>24</sup> Hypoplastic defects run in harmony with the incremental growth pattern. Caries, on the other hand, is found in zones which do not correspond with growth zones but is usually associated with pits, fissures and surfaces that are not readily cleaned during mastication.

It is significant that the molars of rats, which often show extensive and ravaging decay, reveal good formation and calcification in histologic sections. It is equally significant that the animals that suffered severe disturbances in calcification, as from parathyroidectomy and fluorosis, showed no greater incidence of caries in the molars than did the control animals.

18 Weaver R. The Relative Importance of Various Factors in the Etiology of Caries. Ber. IX. Internat. Zahnärztl. Kongr. part 1 1:37, 394, 1936.

19 Black G. V. Ph. thesis Characteristic of Human Teeth and Their Relation to Their Diseases. Dental Cosmos 37:353-421, 1897.

20 Turkheim H. Caries for chung Fortsch. d. Zahnheilkunde 6(4):312-316, 1930.

21 Kanthak F. F. Velocity of Solubility of Various Samples of Dental Enamel. J. Dent. Research 11:21-28, 1934.

22 Arnim S. V. Aberle S. D. and Lutney E. H. Dental Caries in Indian Children. J. Am. Dent. A. 24:4480 (March) 1931.

23 Mellanby M. V. Influence of Diet on Caries in Children's Teeth. Medical Research Council Special Report Series No. 211, London, 1931.

24 McKay F. S. The Establishment of a Definite Relation Between Enamel That Is Defective in Its Structure and Mottled Enamel and Its Liability to Decay. Dental Cosmos 71:47-50 (Aug) 1929.

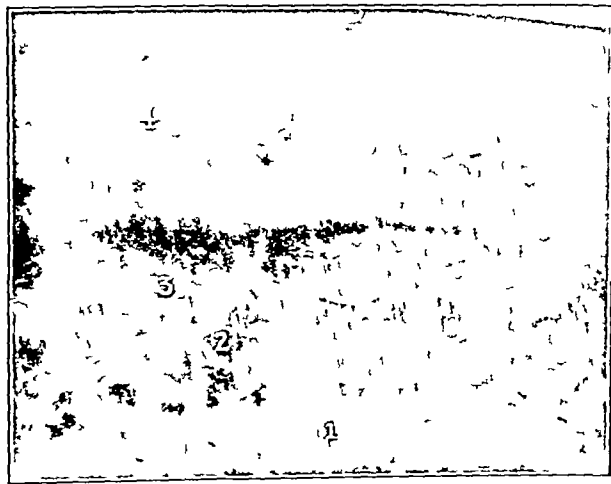


Fig 1—The labial dentin of a rachitic rat showing the various steps in the formation of the incremental striations. (1) first stage in the formation of calcospherites (2) calcospherites showing Liesegang ring phenomenon (3) beginning of coalescence of calcospherites and (4) completely coalesced calcospherites resulting in the incremental striations.

the fibers of the periodontal membrane and ankylosis of submerged teeth are additional conditions which await further investigation for a fundamental understanding of their etiology.

**Carus and Tooth Structure**—It has been claimed that faulty calcium metabolism is conducive to caries because it results in defective structure which in turn

15 Tomes John. Dental Physiology and Surgery. London: John W. Parlier, 1848.

16 Berger Adolph and Berke J. D. Calculus of the Submaxillary Gland. J. Am. Dent. A. 23:159-168 (Aug) 1930.

17 Kresfeldt Ludwig. Histopathology of the Teeth and Their Surrounding Structures. Philadelphia: Lea, Febiger, 1930.

The available evidence indicates that disturbances in calcium metabolism do not have a significant role in the etiology of caries

**Caries and Pregnancy**—Clinical evidence does not support the popular saying "A tooth for every child." Carefully controlled clinical studies and careful statistical analysis have shown that pregnancy per se is not conducive to caries. Statistical clinical investigations have shown that the incidence of caries in pregnant women is no greater than in nonpregnant women of corresponding ages.<sup>25</sup>

#### CALCIUM METABOLISM AND THE GROWING TOOTH

In direct contrast to the high stability and the relative insensitivity of the adult tooth, opposite conditions present themselves in regard to teeth that are still growing and calcifying.

**The Growing Tooth as a Kymograph**—Erdheim<sup>26</sup> has justly compared the calcifying dentin of the incisor of the rat to the drum of a kymograph, on which vacillations in calcium metabolism are recorded in an accurate and easily readable manner. Schour and Smith<sup>2</sup> have shown an equally high degree of sensitivity in the calcifying enamel of rats by means of the administration of fluorine. More recently, Schour and Poncher<sup>28</sup> have been able to show that Erdheim's analogy applies to the growing enamel and dentin of the human tooth as well as to those of the rodent incisor. In a number of delicate experimental attacks that involve modifications in calcium metabolism, the calcifying dental tissues will show clean-cut responses that are not recognizable in any other tissues (figs 2 and 3).

**Methods Used in the Study of the Calcification of Teeth**—While it is possible to recognize, by an indirect approach, different degrees of calcification in stained sections of decalcified enamel and dentin, a satisfactory staining method of ground sections is not yet known. Staining methods with silver nitrate<sup>29</sup> or alizarin<sup>30</sup> hold some promise and merit further application and investigation.

There is urgent need for the discovery of new methods and the application and improvement of available methods for the purpose of analyzing quantitative and qualitative differences in the calcification of the hard dental tissues. Important results have already come from the use of soft x-rays<sup>31</sup> (fig 4), microhardness tests,<sup>32</sup> microchemical analysis<sup>33</sup> and x-ray dif-

fraction studies.<sup>34</sup> The application of micro-incineration in dental research also gives promise of significant results.

**The Normal Process of Calcification**—Little is known regarding the chemistry of calcification in general, and even less is known regarding the chemical processes in the calcification of the dental tissues. The work of Van Slyke and Peters<sup>35</sup> and the recent volumes of the "Annual Review of Biochemistry"<sup>36</sup> contain a general survey on calcification.

The enamel is a cuticular secretion of the ameloblasts which later becomes impregnated with lime salts. Von Ebner<sup>37</sup> described the following stages in the calcification of enamel: primary, young transitional and fully matured. Chase<sup>38</sup> confirmed and extended these conclusions. The enamel in the first three stages is acid resistant. The fully matured enamel is acid soluble.

Dentin consists of a collagenous matrix in which lime salts are embedded. The calcification of dentin proceeds along an incremental pattern at rhythmic intervals of 16 microns.<sup>39</sup> There is a small time difference in which formation precedes calcification. As the dentin-forming cells recede pulpally and migrate distally, they continually form new dentin matrix while the matrix formed on the previous day is calcifying.

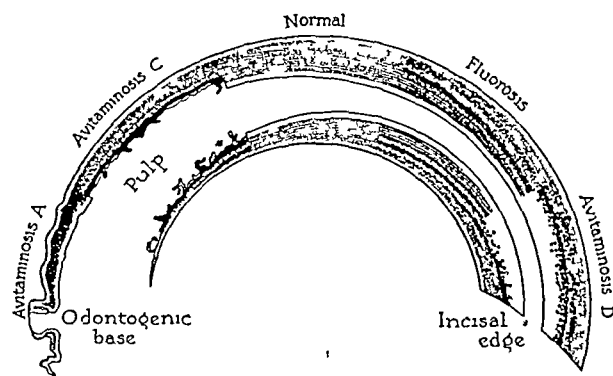


Fig 3—A composite diagram of the different levels of the labial (convex) and the lingual (concave) portion of the dentin of the incisor of the white rat. The labial and lingual dentin are separated in the center by the pulp. The sections indicate the characteristic disturbances in the formation and the calcification pattern of the dentin associated with particular dietary interferences. This diagram shows the kymographic quality of the dentin.

The matrix is calcified in the form of calcospherites<sup>40</sup> which follow the typical Liesegang ring formation,<sup>41</sup> when one globule enters the sphere of influence of another a fusion occurs (fig 1). Normally calcified dentin appears homogeneous because of complete fusion of a large number of spherical areas. Even in the normal condition, however, the successive layers of the dentin are not equally well calcified. Well calcified layers, which stain more readily with hematoxylin, alternate regularly and rhythmically with less well

25 Ziskin D E. The Incidence of Dental Caries in Pregnant Women. *Am J Obst & Gynec* 12: 710-719 (Nov.) 1926. Starobinsky I. Beobachtungen über Zahncaries bei Schwangeren. *Deutsche Monatsschr f Zahnheilk* 47: 238-244 1929. Mull J W, Bill A H and Kinney F M. Variations of Serum Calcium and Phosphorus During Pregnancy. II Effect on Occurrence of Dental Caries. *Am J Obst & Gynec* 27: 679-683 (May) 1934. Klein H. The Effects of Pregnancy on the Incidence of Tooth Decay. *Dental Cosmos* 77: 864 1935.

26 Erdheim J. Ueber die Dentinverkalkung im Nagezahn bei der Epithelkörperchen-Transplantation. *Frankfurt Ztschr f Path* 7: 29 1911.

27 Schour Isaac and Smith Margaret C. Mottled Teeth. An Experimental and Histologic Analysis. *J Am Dent A* 22: 796-813 (May) 1935.

28 Schour Isaac and Poncher Henry G. Rate of Apposition of Enamel and Dentin Measured by the Effect of Acute Fluorosis. *Am J Path* Child 5: 4-57 (Oct.) 1937.

29 Williams J L. Disputed Points and Unsolved Problems in the Normal and Pathological Histology of Enamel. *J Dent Research* 5: 27 1926.

30 Gottlieb B. Untersuchungen über die organische Substanz im Schmelz Menschlichen Zähne. *Oesterr ungar Vrtshschr f Zahnheilk* vol 31 No 1 1915.

31 Applebaum E, Hollander F and Bodecker C F. Normal and Pathological Variations in Calcification of Teeth as Shown by the Use of Soft X-Rays. *Dental Cosmos* 75: 1097-1105 1933.

32 Hodge H C. Microhardness Studies of Dentin. *J Dent Research* 15: 156-157 1935.

33 LeFevre Marian L, Bale W F and Hodge H C. The Chemical Nature of the Inorganic Portion of Fetal Tooth Substance. *J Dent Research* 16: 85-101 1937.

34 Van Huysen G, Bale W F and Hodge H C. Comparative Study of X-Ray Absorption Properties of Normal and Pathological Dentin by Denситometric and Ionization Methods. *J Dent Research* 11: 168-169 1934.

35 Peters J P and Van Slyke D D. Quantitative Clinical Chemistry. Baltimore: Williams & Wilkins Company 1931.

36 Annual Review of Biochemistry, edited by J W Luck. San Francisco: Stanford University Press 1932.

37 von Ebner J. Ueber die histologischen Veränderungen des Zahn schmelzes während der Erhärtung insbesondere beim Menschen. *Arch f mikr Anat* 67: 18 1906.

38 Chase S W. The Nature of the Enamel Matrix at Different Ages. *J Am Dent A* 22: 1343-1352 (Aug) 1935.

39 Schour Isaac and Hoffman M M. Demonstration of a 16 Micron Rhythm in the Stratification of Enamel and Dentin in Man and Other Mammals. *J Dent Research* 15: 161 1935.

40 Harting I. On the Artificial Production of Some of the Principal Organic Calcareous Formations. *Quart J Micr Sc* 20: 118-123 1872.

41 Thompson D Arcy W. On Growth and Form. London: Cambridge University Press 1917.

calcified layers, which stain more readily with eosin. Thus there arises in the dentin a stratification which consists of pairs of dark and light increments. These pairs are of uniform width (approximately 16 microns) and give the dentin its regular and characteristic incremental calcification. The dentin immediately next to the pulp consists of the newly formed matrix, which is not yet calcified and is called the predentin.

When the globular calcification is incomplete, the areas of dentin between the globules take an eosin stain and constitute interglobular dentin.

The normal process of secondary calcification which parallels the dentinal tubules results in an increased deposition of calcium which is in direct proportion to the age of the particular dentin increment.<sup>42</sup>

**Histophysiologic Aspects of Calcification**—Recent investigations have pointed out several histophysiologic processes concerning the calcification of teeth.

**Calcification Rhythm** A series of experimental studies established the existence of a common and basic calcification rhythm in the enamel and the dentin of teeth of mammals and man.<sup>39</sup> This rhythm recurs

in units of 16 microns and constitutes a twenty-four hour phenomenon in the rodent incisor<sup>43</sup> and a much slower process in the monkey and in man.<sup>44</sup>

**The Neonatal Ring and the Calcification Pattern** Another advance in our knowledge is the recent discovery of the neonatal ring<sup>45</sup> which records in the human deciduous tooth the biologic changes that the new-born infant experiences during its effort to adjust from an intra-uterine to an extra-uterine existence.<sup>46</sup>

This discovery automatically constitutes the first important stepping stone to the recognition and analysis of a constant calcification pattern that is superimposed on



Fig. 4—Transverse ground section as shown by grenz rays of an albino rat which was given eight injections of sodium fluoride at forty eight hour intervals. The primary effects of the injections are shown by the radiolucent lines and the secondary effects by the radiopaque lines. Note the radiopacity of the enamel labial to the dentin. This photomicrograph was taken by Dr. Edmund Applebaum of the Oral Histology Department of Columbia University.

the basic 16 micron rhythm and that is associated with broader constitutional periods and adjustments, such as birth or weaning. The neonatal ring serves as a biologic landmark which separates prenatal and postnatal calcification in teeth. The prenatal portions of enamel and dentin appear to be denser than the postnatal portions. This is understandable when one considers that the child in utero takes all the calcium that it requires for its teeth and bones, even at the expense of the mother's calcium. It acts as a scavenger

However, after birth such an equilibrium is not controllable by physiologic mechanisms but is to a good extent dependent on the infant's qualitative and quantitative intake of calcium in the diet.

Experimental studies conducted mainly in the last five years have pointed out a number of factors that influence the calcification of growing teeth. These factors may be classified into two groups, endocrine and dietary.

#### INFLUENCE OF THE ENDOCRINE ORGANS ON CALCIFICATION

**The Parathyroids**—These glands appear to be the most important endocrine organs as far as calcium metabolism is concerned. Their removal disturbs the calcification of the dentin in a characteristic manner and also produces enamel hypoplasia (fig. 2). Erdheim's<sup>47</sup> original announcement of his observations stimulated Fleischmann<sup>48</sup> to conduct a comprehensive clinical study of defects in the enamel of children's teeth. He found that many instances of enamel hypoplasia were associated with a history of tetanic convulsions. The latter are often manifestations of underfunction of the parathyroids.

A recent investigation<sup>49</sup> on the effects of parathyroidectomy on the incisors of over 100 rats and their modifications after periodic fasting or repeated pregnancies and lactations showed the delicate response of the dentin to these experimental alterations. Fasting every seventh day accentuated the typical parathyropropric changes. Repeated pregnancies and lactations produced the most severe alterations. However, in no instance was there histologic evidence of withdrawal of calcium from the teeth.

Erdheim<sup>26</sup> in 1911 succeeded in removing the parathyroids and transplanting them in the same animal. He was able to demonstrate that the dentin that was formed during the time that elapsed between the removal of the glands and the vascularization of the transplant was not calcified. He was so impressed with the delicacy of this reaction that he was prompted to compare the dentin of the incisor of the rat to a kymograph which records changes in calcium metabolism.

**Experimental Hyperparathyroidism** The effect of single injections of parathyroid extract on calcification in the normal animal was studied by Schour and Ham.<sup>49</sup> The blood calcium level was found to rise above normal at first and then return to normal. Histologic study showed that the dentin formed during the rise was poorly calcified (primary reaction) and that the dentin formed during the fall was excessively calcified (secondary reaction).

In another study<sup>50</sup> in which multiple injections of parathyroid extract were administered, similar changes were observed in the dentin. In addition the alveolar bone showed osteoclastic activity and fibrous changes in the bone marrow.

**Clinical Hyperparathyroidism** Recent clinical studies of the dental changes associated with hyperparathyroidism confirm the experimental observations in respect to the changes in the alveolar bone. Borg<sup>51</sup> cited in addition to his own clinical case fourteen others in

42 Hollander, Franklin. Study of Dental Calcification by Means of X-Ray Absorption Coefficient. *J. Dent. Research* 15: 362, 1936.

43 Schour, Isaac and Hoffman, M. M. Experimental Demonstration of the Daily Accretion of 16 Micra of Enamel and Dentin in Growing Mammalian Teeth. *J. Dent. Research* 15: 161, 162, 1935.

44 Schour, Isaac and Maier, M. The Rate and Gradient of Growth in Human Deciduous Teeth with Special Reference to the Neonatal Ring. *J. Dent. Research* 16: 149, 1937.

45 Schour, Isaac. The Neonatal Line in the Enamel and Dentin of the Human Deciduous Teeth and First Permanent Molar. *J. Am. Dent. A.* 22: 10-6-105 (Oct.) 1936.

46 The Neonatal Line in Human Growth editorial. *J. A. M. A.* 105: 507 (March 1) 1937.

47 Erdheim, J. Tetania Parathyreopriva Mitt. a. d. Grenzgeb. d. Med. u. Chir. 16: 632-744, 1906.

48 Fleischmann, I. Virch. Arch. f. Zell. 25: 8/8, 1902.

49 Schour, Isaac and Ham, A. W. The Action of Vitamin D and of the Parathyroid Hormone on the Calcium Metabolism as Interpreted by Studying the Effect of Single Doses on the Calcification of Dentin. *Arch. Path.* 17: 22-39 (Jan.) 1934.

50 Borg, J. F. Hyperparathyroidism: a New Consideration for the Dentist. *J. Am. Dent. A.* 22: 16-3 (Oct.) 1937.

which oral symptoms occurred from six months to six years or more previous to the final diagnosis of hyperparathyroidism

Borg pointed out that early recognition on the part of the dentist of the possible diagnosis of hyperparathyroidism and his reference of the patient for a medical examination might have saved many teeth that were extracted and resulted in the prompt treatment of the underlying disturbance

A roentgenogram of the jaws often shows osteoporotic changes in the early stages and a granular and mottled appearance in the later stages

Additional symptoms may be cysts and giant cell tumors. The latter tend to recur after surgical removal as long as the parathyroid tumor persists. The teeth may become loose as a result of the active resorption of the alveolar bone. They have often been extracted unnecessarily, because in other cases prompt diagnosis and surgical removal of the parathyroid tumor have resulted in recovery of the bone and tightening of the teeth.<sup>51</sup>

**Hypophysis**—The removal of the hypophysis produces among other distinct alterations, such as marked retardation of eruption, a disturbance in calcification<sup>52</sup> (fig 2). The indications are that the calcification is denser than normal. It is difficult to establish the reason for this condition. It is possible that the retarded eruption permits the dentin to be calcified for a longer period, so that it receives more calcium by means of secondary calcification.

After hypophysectomy, the involvement of other endocrine glands, particularly the parathyroids and the adrenals, plays a part in the dentin picture. In some cases the predentin area of the most recently formed dentin shows many fine isolated dentin globules. They remind one of the characteristic sprinkling seen in the predentin of adrenalectomized rats<sup>53</sup> and suggest the possible influence of the atrophic changes of the adrenals that occur after hypophysectomy. To what extent the denser calcification may be associated with an alteration of the functional activity of the parathyroids is not known.

**Gonads**—Changes in the teeth of eunuchs have not been reported in the literature. This is not surprising, since practically all castrations were performed not soon after birth but at a time when the development of the teeth was practically completed. In a recent study, however, the incisors of castrated or ovariectomized ground squirrels revealed prominent disturbances in calcification which could be recognized in 54 per cent of the cases in roentgenograms and in 91 per cent of the microscopic sections<sup>54</sup> (fig 2).

**Adrenals**—Examination of the incisors of completely adrenalectomized rats show characteristic changes in the calcification of the dentin.<sup>55</sup> The dentin shows a denser calcification, and the predentin is sprinkled with hematoxylin-staining globules (globular predentin, fig 2).

It is interesting to note that practically every endocrine gland which has been found to produce charac-

teristic effects on the teeth is also exerting an influence on the calcification of the teeth. By examining the nature of the disturbance in calcification, it is often possible to tell which endocrine gland was disturbed without the knowledge of the experimental records. Figure 2 shows in a diagrammatic manner the characteristic differences in the dentin of the incisor of the rat associated with particular endocrine interferences.

#### INFLUENCE OF THE VITAMINS ON CALCIFICATION

The sensitive response of the tooth to endocrine disturbances is closely rivaled by its response to vitamin deficiencies (fig 3). The influence of vitamin D on dental calcification is well known. The association of vitamin D and rickets is well established, although the pathogenesis of rickets is still being actively investigated in a number of research laboratories.

Schour and Ham<sup>49</sup> studied the effect of single administrations of viosterol (irradiated ergosterol) on the dentin of the rat incisor. The effects were similar to those obtained with single injections of parathyroid extract, namely, a primary reaction in the form of a poorly calcified dentin stripe, which seemed to be related to the rise of the blood calcium content, and a secondary reaction in the form of a well or excessively calcified dentin stripe, which seemed to be related to the return of the blood calcium to normal.

The delicacy of the response of dentin to vitamin D deficiency can be illustrated by the following experience. In a study in which Margaret Smith and I<sup>56</sup> collaborated, some of the control animals which she sent to our laboratory showed a picture of interglobular dentin beyond normal range. This was at first disconcerting, because adequate controls constitute a primary essential in each experimental investigation. I suspected that the basal diet was slightly deficient in vitamin D. On further investigation it was found that whole milk was the only source of vitamin D and that for this group of animals such an amount was not sufficient. The fortification of the diet with a few drops of viosterol corrected the calcification of the dentin and solved our problem of establishing the proper control picture.

The clinical problem of preventing the effects of vitamin D deficiency in growing teeth is not serious today. As a result of education, the beneficial effects of cod liver oil are well appreciated by the public. In fact, the problem may be how to be cautious against the possible effects of hypervitaminosis D. While cod liver oil has been a safe source of vitamin D, the dangers of careless and too liberal use of concentrates must be considered.

Calcification is also disturbed by other vitamin deficiencies. In the incisors of rats placed on diets deficient in vitamin A, abnormal calcification occurs in the pulp<sup>57</sup> (fig 3), and prominent interglobular dentin is common in the labial dentin.<sup>58</sup>

Calcification of the predentin zone is one of the characteristic changes of vitamin C deficiency in guinea pigs<sup>59</sup> (fig 3). The recognition of the sensitivity of the incisor of the guinea pig to vitamin C deficiency has paved the way for the biologic method of assaying

<sup>51</sup> Barr, D. P. and Bulger, H. A. The Clinical Syndrome of Hyperparathyroidism. *Am. J. M. Sc.* **129**: 449-476 (April) 1930.

<sup>52</sup> Schour, Isaac and van Dike, H. B. Changes in the Teeth Following Hypophysectomy. *Am. J. Anat.* **50**: 397-433 (July) 1932. Schour, Isaac. The Hypophysis and the Teeth. I. Changes in the Rat Incisor Following Hypophysectomy. *Angle Orthodontist* **4**: 321 (Jan.) 1934.

<sup>53</sup> Schour, Isaac and Rogoff, J. M. Changes in the Rat Incisor Following Bilateral Adrenalectomy. *Am. J. Physiol.* **116**: 334-344 (April) 1936.

<sup>54</sup> Schour, Isaac. Changes in the Incisor of the Thirteen-lined Ground Squirrel (*Citellus tridecemlineatus*) Following Bilateral Gonadectomy. *Am. Rec.* **65**: 17, (May 25) 1936.

<sup>55</sup> Wolbach, S. B. and Howe, P. R. The Incisor Teeth of Albino Rats and Guinea Pigs in Vitamin A Deficiency and Repair. *Am. J. Path.* **9**: 275 (May) 1933.

<sup>56</sup> Schour, Isaac and Smith, Margaret C. Changes in the Rat Incisor Following Vitamin A Deficiency to be published.

<sup>57</sup> Hoyer, A. Effects of Vitamin C Deficiency on Guinea Pig Teeth. *Acta Paediat.* (suppl.) **2**: 8-1924. Boyle, P. E., Wolbach, S. B. and Beecey, O. A. Histopathology of Teeth of Guinea Pigs in Acute and Chronic Vitamin C Deficiency. *J. Dent. Research* **15**: 331-332 1936.



the Vitamin C content of foods. Fish and Harris<sup>58</sup> made a critical analysis of the disturbances in the calcification of dentin in vitamin C deficiency.

#### THE EFFECT OF FLUORINE—MOTTLED TEETH

Little is known of the influence of deficient or excessive amounts of particular inorganic or organic elements in the diet. A study of the influence of heavy metals, such as lead, aluminum and selenium, gives promise of significant results. In contrast to our extremely limited or lack of knowledge of these factors, our present knowledge on the influence of fluorine is considerable.

*The Cause of Mottled Enamel*—For many years a type of enamel hypoplasia known as mottled enamel was a challenging problem to the dental profession. The condition was endemic and characterized by a destructive chalky opacity and pitting of the enamel. Black and McKay<sup>59</sup> first attempted to elucidate the underlying cause of this dental defect and were instrumental in initiating the large amount of research that followed. In 1931 Churchill<sup>60</sup> suggested and Smith<sup>61</sup> established independently by animal experiments that chronic fluoride intoxication is the direct cause of mottled enamel.

Smith and her co-workers<sup>62</sup> succeeded in reproducing the mottling of teeth in rats by adding to their diet concentrates of water from the communities in which mottled enamel was endemic. Following a suggestion by McCollum,<sup>63</sup> they were able to reproduce the same condition by adding sodium fluoride to the diet. An analysis of the water from the communities in which the condition was endemic revealed a high content of fluorine.

After the proof was established that mottled enamel is caused by the toxic action of fluorides in water, the next step was to investigate the mechanism by which fluorine disturbed the teeth. Here again animal experimentation proved to be necessary and enlightening.

*Histologic Analysis of Dental Changes*—The dental changes produced by fluorides given to animals in their diet or administered by injections were then subjected to histologic analysis<sup>64</sup> (fig. 4). The dietary experiments showed disturbances in the calcification of the dentin as well as the enamel (fig. 3). It seemed therefore that a better and more inclusive term for the mottled condition would be "mottled teeth" rather than "mottled enamel." The injection experiments produced sharp effects that were easily recognized as bands of defective pigmentation and calcification in the enamel. These changes could be seen with the naked eye, so that any one could tell the number of injections given to an animal by counting the bands on the enamel surface. The microscopic sections of the teeth showed corresponding bands of disturbed calcification in the

dentin. In cross sections these appeared in the form of concentric rings (fig. 4) similar to those seen in the tree. Further microscopic analysis shows that the effect of each injection consists of an imperfect hypocalcified layer in the dentin and in the enamel. A secondary recovery reaction follows the first and is evidenced as a normal or hypercalcified layer.

*The Sensitivity of the Enamel-Forming Cells to Fluorides*—The enamel-forming cells (anablasts, or ameloblasts) are the first cells to be affected. In rats the effect can be recognized histologically in the enamel-forming cells within one hour after a single injection. By the effect on the cell, the formation of the enamel is disturbed. The disturbance in calcification which occurs at the same time is probably brought about by the deposition of calcium fluoride in the tissue instead of the normal calcium salts ( $\text{PO}_4$  or  $\text{CO}_3$ ) and possibly also by a disturbance of the enzymatic phosphatase system concerned in calcification<sup>65</sup>.

The experiments thus showed that the effect of the fluorides was prompt and localized first in the formative organ of the tooth.

The effects of chronic fluorine intoxication on bone development, enzymatic action, body growth, respiration and reproduction are striking and destructive<sup>65</sup>. These effects, however, are produced only by increased doses of sodium fluoride. The growing tooth is the first and the most delicate organ to react to the ingestion of fluorides.

*Recent Developments in Our Knowledge of Mottled Teeth*—More recently there have been several interesting developments in our knowledge concerning fluorosis and mottled teeth. Neff<sup>66</sup> has suggested a method whereby the fluorine content of a given water supply can be determined by the microscopic study of the teeth of fish that are allowed to live in that medium.

Brinch and Roholm<sup>67</sup> discovered mottled enamel in the teeth of two children of a woman who suffered from chronic fluoride poisoning contracted during her work in an industrial plant which used cryolite ( $\text{Na}_3\text{AlF}_6$ ). The prolonged nursing of these children with their mother's milk affected the permanent teeth. This interesting observation has been confirmed by the Smiths,<sup>68</sup> who found severe mottling of the enamel of temporary teeth of breast-fed infants in communities where the fluorine content of the water supply was exceedingly high.

They also found mottled deciduous teeth in children who were artificially fed with milk that was diluted with water containing a high fluorine content (twelve or more parts per million). This fact raises an interesting question: Why are deciduous teeth not susceptible to fluorine except in doses that are considerably higher than those sufficient to produce the mottled condition in permanent teeth? Smith suggested the possibility that calcification proceeds more rapidly in the temporary than in the permanent teeth. It is also possible that the proportion of fluorine-containing foods is smaller in the diet of the infant than in that of the older child. The prevention of the dental effects of fluorosis presents an important problem in public health.

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REACTION OF DENTIN TO VARIOUS DISTURBANCES  
IN CALCIUM METABOLISM

*The Calciotraumatic Ring*—A prompt and acute response in the dentin has been observed repeatedly in association with the effects of injections of parathyroid extract<sup>10</sup> or sodium fluoride.<sup>2</sup> The immediate primary hypocalcified zone following the injection of sodium fluoride may often be readily demarcated from the pre-experimental dentin by a fine narrow hematoxylin-staining zone, which facilitates the recognition of the starting point for measuring the width of postoperative dentin.

This acute response of dentin offers an interesting problem for analysis. It seems to be an expression of a shock to calcium metabolism. This may be induced by the trauma incident to surgical intervention, anesthesia or acute endocrine disturbances. It may be an effect of overcalcification associated with a brief period of arrested growth. Regardless of the particular source of this reaction, it may be considered an experimentally or otherwise induced effect of hypercalcification in the dentin. The ring itself might be referred to as the calciotraumatic dentin ring. It illustrates in an accentuated manner the normal dual character of the calcification of dentin, which consists of a rhythmic alteration of dense and less dense mineralization.

An analogous macroscopic condition has been observed in the roentgenograms of long bones which register transverse lines of arrested growth<sup>69</sup> or scars<sup>70</sup> in response to various acute disturbances.

## IS CALCIUM THERAPY INDICATED?

The Council on Dental Therapeutics recently published a comprehensive report entitled "Calcium and Phosphorus Compounds in Dentistry"<sup>71</sup> in which its position against indiscriminate calcium therapy is shown to be well founded. I am in full agreement with this position.

On the basis of our present knowledge, calcium therapy in dentistry per se is not indicated. In cases in which the individual conditions might call for such therapy, on the basis of medical and systemic needs, the prescription should come from the physician. Aside from the fact that calcium therapy is not needed in the vast majority of cases, there is danger in the routine use because of the harm that may result. One instance that was reported to me by a well recognized pediatrician will illustrate the abuse to which calcium therapy may be subjected. This pediatrician was called by a frantic mother who reported that her little girl was unable to pass her feces and needed immediate help. The physician found that the feces was practically calcified, and he had to break up the mass in order to relieve the child. The clinical history showed that the family dentist had prescribed dicalcium phosphate to arrest caries in the teeth of the child. He did not prescribe the dose but told the mother that it was like candy and the child could eat all she wanted. In addition the child had suffered from slow bowel movement. The alkalis in the stools from the alkaline digestive juices of the bile and the pancreas united with the excess dicalcium phosphate to form insoluble calcium

soaps. Three mistakes were made. The wrong treatment for caries was used, an inaccurate dosage was given and the child's general health was not considered.

## GENERAL CONSIDERATIONS AND CONCLUSIONS

1 It is important to distinguish between the adult tooth which is essentially completed in formation and calcification and is fully erupted, and the tooth that is still in a growing and formative stage. The biologic reaction of the tooth naturally varies with the different periods of its life span.

2 Present evidence establishes the fact that the adult and fully erupted tooth is as a whole not subject to modification in structure or calcification by changes in calcium metabolism. The calcium content of dentin may be slightly increased with age by secondary calcification. However, unlike bone, enamel and dentin are not storehouses of calcium and are not subject to withdrawal.

3 Present evidence has not established a correlation between calcium metabolism and caries and offers no factual basis for the view that the incidence of caries is increased because of the metabolic changes that occur during pregnancy. Clinical and statistical evidence shows a similar incidence of caries in pregnant women and in nonpregnant women of corresponding age.

4 The indications are that the response of the growing and calcifying tooth to changes in calcium metabolism induced by endocrine factors and vitamin and other dietary factors is characteristic and to some extent pathognomonic because the calcifying dental tissues are uniquely specialized and sensitive structures.

5 Most of the evidence on the delicate, accurate and prompt response of the calcifying tooth to calcium disturbances is derived from data obtained from animal experimentation especially on the incisor of the rat, which is a tooth of continuous growth. Nevertheless, recent results of studies on human beings indicate that human teeth are also very sensitive and possess similar kymographic qualities.

6 The kymographic qualities of human teeth facilitate the analysis of the calcification pattern of teeth and constitute the basis for tooth ring analysis as an aid in the assessment of health and disease.

7 The employment of calcium therapy in dentistry per se is not justifiable. There is no evidence to show that alterations in calcium metabolism give rise to oral or dental disturbances without producing other systemic symptoms. When systemic manifestations are present, the responsibility for calcium therapy should rest with the physician.

1838 West Harrison Street

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**Some Growth Studies Unreliable**—Many growth studies have been carried on by persons who have not been trained in the technique of anthropometry (which is by no means easy to acquire), and the measurements are consequently unreliable. The bulk of the subjects studied has not been assorted racially or even on the basis of national origins, so that the conclusions derived from the heterogeneous material are of dubious value. There are, of course, many exceptions to these generalizations, but, in my opinion, much of the effort expended in growth studies has been unintelligent and pointless. Such studies, unless undertaken for the simple purpose of demonstrating racial differences, should be so intimately associated with pediatrics as to furnish the controls and the knowledge of individual development with which to correlate the diseases and nutritional variations of childhood.—Hooton E. A. Apes, Men, and Morons, New York, G. P. Putnam's Sons, 1937, page 245.

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## THE USE OF HELIUM IN ANESTHESIA

URBAN H. EVERSOLE, M.D.

BOSTON

Helium is one of the most recent additions to the list of gaseous therapeutic agents. Its therapeutic use was first reported by Barach.<sup>1</sup> He obtained beneficial results frequently when helium was used in the treatment of patients in status asthmaticus who were completely refractory to epinephrine as well as in the treatment of patients suffering from severe asthma who were partially refractory to epinephrine. He has also reported favorable results when it was used in the treatment of obstructive lesions, usually of inflammatory origin, of the larynx, trachea and bronchi. Barach<sup>2</sup> has also employed helium and oxygen mixtures to advantage as substitutes for pure oxygen in the treatment of patients suffering from emphysema, bronchiectasis or pulmonary fibrosis.

The purpose of this paper is to present an additional group of cases in which helium was used clinically. The patients had various respiratory difficulties during the course of anesthesia.

## HISTORY OF HELIUM

Helium, argon, krypton, neon and xenon comprise the "rare atmospheric gases." These five gases together constitute approximately 1 per cent of the atmosphere.

The bright yellow spectral line of helium was first observed in the solar spectrum by Janssen<sup>3</sup> and Lockyer,<sup>4</sup> during an eclipse of the sun in 1868. Helium was discovered by Sir William Ramsay<sup>5</sup> in 1894, when he obtained it from the mineral cleveite. Its presence in the air was first demonstrated spectroscopically by Kayser in 1894, but the actual separation of helium from the air was first accomplished by Ramsay and Travers in 1895.<sup>6</sup> The quantity of helium in the air is small, only about one part in 185,000. Helium is present in much greater quantities in natural gases, where its percentage varies from 0.01 to 1.84. The natural gas richest in helium is found in Kansas, Oklahoma and Texas.

## PROPERTIES

Helium is a colorless, odorless and entirely inert monatomic gas, with a molecular weight of 4 and a specific gravity compared with air of 0.138. It is therefore with the exception of hydrogen (molecular weight 2) the lightest element. A mixture of 21 per cent oxygen and 79 per cent helium has a specific gravity of 0.341, hence it is about one third as heavy as air. The specific gravity of oxygen is 1.105, while that of nitrogen is 0.967. Helium is noninflammable and nonexplosive. Since it is chemically inert it does not form compounds and has no positive valence. It is, in all probability, physiologically inert.

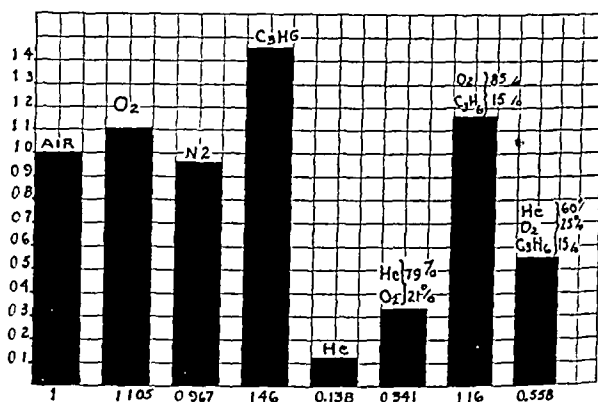
In 1931 Hershey<sup>7</sup> reported that atmospheres from which the rare gases were excluded were incompatible

with life. This observation was not corroborated by Barach.<sup>8</sup> He kept animals alive for as long as forty-two days, with no apparent harm, in atmospheres from which the rare gases had been excluded. Furthermore he kept mice alive in completely sealed chambers containing 79 per cent helium and 21 per cent oxygen for as long as two months without any apparent injury. Orcutt and Waters<sup>9</sup> also reported that the elimination of the rare gases from atmosphere was not harmful to experimental animals.

## CLINICAL USES

Since helium is entirely inert, the basis for its clinical use depends entirely on its physical properties of low specific gravity and rapid rate of diffusion.

It is approximately one eighth as heavy as oxygen and one seventh as heavy as nitrogen, while a mixture of 79 per cent helium and 21 per cent oxygen is about one third as heavy as air and slightly less than one third as heavy as pure oxygen. Hence, on the basis of the physical formula that  $F$  equals  $MA$ , where  $F$  is force,  $M$  is mass and  $A$  is acceleration, the force required to move a given volume of 21 per cent oxygen



The specific gravities of various gases and gaseous mixture

and 79 per cent helium should be approximately one third that required to move the same volume of air and slightly less than one third that required to move the same volume of pure oxygen. A mixture of 60 per cent helium, 25 per cent oxygen and 15 per cent cyclopropane has a specific gravity of 0.558, which is about one half that of a mixture of 85 per cent oxygen and 15 per cent cyclopropane (1.16).

The rate of flow of gases through narrow orifice is inversely proportional to the square root of their molecular weights. On this basis the rate of flow of a mixture of 79 per cent helium and 21 per cent oxygen through a narrow orifice should be about twice that of air. Therefore the addition of helium to any gas or mixture of gases will result in a lighter and more diffusible mixture, which will require less force (therefore less muscular effort) to be moved. Regarding from another angle, the same force will move a larger volume of the mixture in a given length of time.

These peculiar physical properties led Barach to employ helium in the treatment of the various conditions previously mentioned. Also on the basis of the physical properties we have administered helium to patients in whom certain respiratory difficulties

From the Department of Anesthesia, the Lahey Clinic.  
Read before the International Congress of Anesthetists, Chicago, Oct. 20, 1932.

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occurred during the course of anesthesia. These difficulties were the result of stridor, respiratory obstruction or muscular weakness caused by spinal anesthesia reaching a height in the spinal canal sufficient to impair intercostal activity.

The presence of stridor during the administration of an inhalation anesthetic is not an infrequent occurrence, and while it is not a serious complication unless accompanied by obstruction, it is annoying to the operator as well as to the anesthetist. It is in all probability caused by a partial spasm of the vocal cords, which if sufficient will produce respiratory obstruction.

TABLE 1—Results from the Use of Helium for the Relief of Respiratory Difficulties Occurring During the Course of Anesthesia

	Total No. of Cases	Complete Relief		Partial Relief		No Relief	
		No	%	No	%	No	%
Stridor alone	39	24	61.5	13	33.3	2	5.1
Partial obstruction	66	31	46.9	24	36.4	11	16.7
Total	105	55	52.4	37	35.2	13	12.4

Laryngospasm is thought by some authorities to occur more frequently when cyclopropane is the anesthetic agent than when other agents are used.

The cases listed as stridor include those in which a crowing-like noise, occurring usually on inspiration, was the only respiratory difficulty, there was no appreciable change in the character of the breathing or in the tidal volume to indicate an obstruction to respiration (table 1).

In the second group of cases there was definite obstruction to respiration. This group includes cases in which the obstruction was mechanical, for instance, postoperative hemorrhage into the tissues of the neck causing tracheal compression or postoperative tracheal edema, as well as ordinary laryngospasm. In all of these cases with the exception of thirteen which will be discussed later, helium was not added until the ordinary methods for the relief of obstruction, such as insertion of oral and nasal breathing tubes, forcible extension of the chin and pressure on the breathing bag, had been tried.

It will be observed from the accompanying tables that of the patients who had stridor alone twenty-four, or 61.5 per cent, obtained complete relief, thirteen, or 33.3 per cent, partial relief and two, or 5.1 per cent, no relief. Of the patients who had both stridor and obstruction, thirty-one, or 46.9 per cent, obtained complete relief, twenty-four, or 36.4 per cent, partial relief and eleven, or 16.7 per cent, no relief.

Thirteen of the cases in which obstruction and stridor were present require further consideration. Obstruction occurred in these cases after thyroidectomy had been performed. It was caused by hemorrhage with tracheal compression or more frequently, by tracheal edema. In all obstruction and stridor were present before administration of the anesthetic was begun. These complications usually occur from twenty-four to forty-eight hours postoperatively, at a time when infiltration of the tissues with a local anesthetic is not very satisfactory. In addition, the obstruction is frequently so severe that the patient is cyanotic when brought to the operating room and it may become complete after the first or second breath of an inhalation anesthetic. Helium was administered to such patients only during the induction period, prior to the insertion of an intratracheal tube. Seven, or 53.9 per

cent, obtained complete relief and four, or 30.7 per cent, partial relief, while two or 15.4 per cent, apparently received no benefit (table 2).

A mixture of helium and oxygen was used in five cases in which partial respiratory paralysis occurred during spinal anesthesia. The paralysis was evidenced by the absence of intercostal activity and the use of the accessory muscles of respiration, and, in addition, the patient said that breathing was difficult. In all of these cases breathing was apparently much easier when the helium and oxygen mixture was administered than when either air or pure oxygen was given. In one case the contents of the breathing bag were changed several times, a mixture of helium and oxygen being alternated with pure oxygen, and in every instance the patient, a physician, said that breathing was much easier when the helium and oxygen mixture was used.

#### TECHNIC

Before beginning the use of helium it would be well to examine the gas machine carefully for all possible leaks, since this gas is much more difficult to keep in a closed system than are the ordinary gases.

Helium is marketed in cylinders similar to those used for oxygen and the anesthetic gases, and the cylinder may be attached to an ordinary gas machine. For machines which do not have gages calibrated for its use, helium may be delivered through a gage calibrated for some other gas. At the Lahey Clinic the tank containing helium is usually attached to the nitrous oxide yoke. The reading on the nitrous oxide gage is multiplied by the factor 3.3 to determine the amount of helium delivered. This factor will give accurate readings only when the flow is 1 liter or more. With flows of less than 1 liter of helium the rate is probably little if any greater than that of nitrous oxide.

From an economic standpoint the closed carbon dioxide absorption technic is the only one adapted to the use of helium.

Since helium is inert and serves as a diluting agent displacing other gases, cyclopropane is the only anesthetic gas now available which is potent enough to

TABLE 2—Results from the Use of Helium for Postoperative Tracheal Obstruction Before Tracheotomy

Total No. of Cases	Complete Relief		Partial Relief		No Relief	
	No	%	No	%	No	%
13	7	53.9	4	30.7	2	15.4

permit the use of large enough quantities of oxygen to allow for any diluting with helium without danger of producing anoxemia. It can, of course, be used with ether anesthesia if the ether is vaporized with oxygen in an entirely closed system.

My associates and I employ two methods of administration, depending on whether the obstruction is present before anesthesia begins or develops during the course of anesthesia.

*Technic When Obstruction Is Present Before Anesthesia Is Established*—A flow of approximately 3 liters of helium and 1 liter of oxygen is started and the mask is immediately placed on the patient's face. The patient is allowed to breathe this mixture for from five to ten minutes or until the obstruction is relieved. The bag is emptied each time it becomes distended. The flow of helium is then discontinued, the flow of oxygen is decreased to the estimated requirement of the patient.

and cyclopropane is added, usually at the rate of from 300 to 500 cc per minute, until the patient is anesthetized. If it is necessary to add more helium, the same method is employed as that to be described for the administration of helium to patients in whom an obstruction has developed after they are anesthetized.

*Technic When Obstruction Develops After Anesthesia Is Established*—The bag is completely emptied, and a flow of 1,200 cc of helium, 500 cc of oxygen and 300 cc of cyclopropane is started. This combination is estimated to produce a mixture containing 60 per cent helium, 25 per cent oxygen and 15 per cent cyclopropane. These amounts may, of course, be varied as indicated. A careful watch should be maintained at all times to avoid the slightest degree of anoxemia. It is usually necessary to continue this rate of flow for from five to ten minutes, emptying the bag each time it becomes distended, to wash out the excess oxygen and the residual nitrogen in the lungs and to be sure that the patient is actually respiring the mixture delivered. At the end of this time, the administration of the helium and the cyclopropane may be discontinued and the flow of oxygen continued at the rate of from 200 to 400 cc a minute. Helium and cyclopropane are now added, at a rate just sufficient to compensate for any leaks that may be present in the system. In cases of severe obstruction, moderate pressure on the breathing bag (from 3 to 10 mm of mercury) is an additional help in the relief of the respiratory obstruction.

The cost of helium, while considerably less than when it was first used, is still an item to be considered. The market price in E sized cylinders is 4 cents a gallon. When from 5 to 10 gallons is used in each case, the cost is from 20 to 40 cents.

#### SUMMARY

Helium was used during either the induction or the maintenance of anesthesia in 110 cases. In most instances it was used for the relief of various types of respiratory obstruction, such as postoperative tracheal edema, compression of the trachea by postoperative hemorrhage and ordinary laryngospasm. In addition, it has been used a few times as an aid to breathing for patients with partial respiratory paralysis caused by spinal anesthesia.

At the Lahey Clinic we believe that the indications for the use of helium are relatively few as evidenced by the comparatively small number of cases in which we have used it even though it has been attached to our gas machines for more than two years.

Of all patients for whom we have used helium for the relief of stridor or obstruction 87.6 per cent obtained either complete or partial relief and 12.4 per cent did not obtain relief.

There is certainly no substitute for a clear and unobstructed airway, and the use of helium is not suggested as a substitute for unobstructed breathing. We do, however, think that in certain cases this gas has been of distinct value in helping us out in an emergency until a tube could be inserted within the trachea. It has also been helpful on many occasions by permitting us to continue smoothly and safely the administration of an anesthetic without inserting an intratracheal tube when otherwise one would have been necessary.

Fortunately our experience with helium as an aid to patients with partial respiratory paralysis has been very limited but in the few cases it has been a distinct aid to respiration.

605 Commonwealth Avenue

## ECONOMY IN MEDICATION

BERNARD FANTUS, M.D.

CHICAGO

In the present intensive study of medical economics, economy in medication must not be overlooked. This is especially important in hospitals. In such large institutions as the Cook County Hospital, the saving resulting from cooperation between prescribing physician and dispensing pharmacist might easily run into such a huge sum that I hesitate to name it. Even in private practice it pays to economize in medication. Some physicians are nothing less than spendthrifts and wasters when it comes to prescribing. The difficulty a doctor finds in collecting bills may sometimes be due to the fact that the patient's family, after paying for expensive medicines may have nothing left with which to pay the doctor.

Of course by economy in medication is not meant the use of inferior remedies, for the first principle of economy in prescribing is that the most efficient remedy is likely to be the cheapest. The second principle in the economy of medication should be: Among drugs of equal efficiency, choose the least expensive. What this might mean in the case of hypnotics and analgesics is illustrated in tables 1, 2 and 3.

It will be seen that two of the three most efficient hypnotics, namely, chloral hydrate and barbitol, are also the cheapest.

#### ECONOMY IN HYPNOTICS

Research such as that carried out by Grabfield,<sup>1</sup> the results of which are given in table 1, needs to be multiplied a hundred times. If its lessons were to be promptly incorporated in practice it would pay for itself many times over. At present, hardly anybody seems to know—and nobody seems to care—how much it is necessary to pay in dollars and cents to secure a certain therapeutic effect.

The chemical manufacturing industry is geared to mass production of new drugs, high speed "clinical testing" and high pressure salesmanship and distribution. Ever new variations of chemical compounds are thrown on the market until this has become a veritable jungle, almost impenetrable to the rays of the light of reason. Even the Council on Pharmacy and Chemistry does not pass on the cost of drugs. Information is lacking on the important practical question of whether these newer therapeutic agents are worth the price. What is needed is evaluation of the newer as compared with the older remedies and with one another. Surely a part of this evaluation should be the question of price.

What valuable results, aside from considerations of economy, such studies yield is illustrated in table 2, which shows that a dose of 0.15 Gm of chloral produced sleep in almost 100 per cent of cases as compared with amytal, of which approximately two doses of 0.05 Gm were required to produce sleep. Hence the pharmacopeial average dose of 0.5 Gm for chloral is over three times as large as it need be, as compared with the hypnotic power of the average efficient (0.1 Gm) dose of amytal. No wonder that chloral, when it is given in such unnecessarily large doses as 1 or 2 Gm, occasionally produces untoward effects. Grabfield's work also reveals the fact astonishing to the pharmacologist that sabromin in double the quantity is as efficient a hypnotic as chloral. This shows, if corroborated,

<sup>1</sup> Grabfield, G. P. Observations on Efficiency of Commonly Used Hypnotics. J. A. M. A. 96: 1865 (May 30) 1931.

rated by others, that its mode of action must be different from that of the bromides, with which it has usually been classed

In table 2 is shown merely how much it costs to induce sleep, not the relative anesthetic value, in respect to which no doubt amytal and pentobarbital sodium might secure quite a different rating. It is not even contended that more expensive agents might not be worth the difference in price. Paraldehyde, for instance, should probably be the hypnotic of choice for "poor risk" patients, even though it costs three times as much as chloral, but it seems self evident that in a charity hospital one has no right to spend from five to forty times the money for a dose of sleep-producing medicine unless it can be clearly shown that the effect is definitely better than that of chloral.

Table 2 illustrates the difference between the "efficiency-price" index of table 1 and the "dose-price" index of tables 2 and 3, the only measure at present applicable in the evaluation of the analgesics. It is evident, when one compares tables 1 and 2, that a 0.5 Gm dose of chloral is a much more potent hypnotic than a 0.3 Gm dose of carbromal or a 0.5 Gm dose of sabromin. The "efficiency-price" index is therefore a much better criterion than the "dose-price" index, but the latter is the best now available to show the relative values of the analgesics. Attention might be called to the last column in tables 2 and 3, the usage "frequency per 10,000 R," which is taken from Prof. E. N. Gathercoal's monumental "Prescription Ingredient Survey."<sup>2</sup> The predominant use of phenobarbital as compared with chloral is probably due in part to its greater analgesic value, to its greater ease of administration and to the propaganda promoting its use.

ECONOMY IN ANALGESICS

A glance at table 3 will reveal that acetanilid is the cheapest of all analgesics but that it has a relatively small usage (23 per 10,000 R), while codeine, which

TABLE 1—'Efficiency-Price' Index of Hypnotics\*

Chemical Group	Drug	Dose Used Gm	Index of Efficiency†	Efficiency Price Index Chloral Hydrate = 1
Alkaloid	Codeine	0.015	0.86	12
Chloroform	Chloral hydrate	0.150	0.97	1
	Butyl chloral hydrate	0.150	0.0	7
	Chlorobutanol	0.150	0.83	5
Barbituric acid	Barbital	0.150	0.94	4.8
	Amytal	0.050	0.93	11.0
	Phenobarbital	0.050	0.69	6.7
	Phanodorn	0.100	0.90	2.5
	Ipral	0.050	0.71	13
	Neonal	0.050	0.86	10
Bromide	Carbromal	0.300	0.0	33
	Bromural	0.300	0.73	33
	Sabromin	0.300	0.95	18

\* Modified from Grabfield's<sup>1</sup> table.  
† Index of efficiency was secured by prescribing half the amount of the recommended doses and noting the number of doses that were required to produce a comfortable night's sleep. In this way the number of patients observed divided by the number of doses required would give such an index.

is one of the most expensive of analgesics, is employed more than any other of these agents (1,019 per 10,000 R). Acetanilid labors under the indictment that it causes methemoglobinemia and collapse. This is possibly true when it is used as it formerly was, in the full antipyretic dose of 0.5 Gm and when repeated every hour for two or three doses until a great fall in temperature is secured. Acetophenetidin is used much more extensively because it is "safer", but it is also

less efficient. It requires at least twice the dose to produce the same effect. Probably the real relation of these two drugs to each other is that they are both merely administration forms of paramidophenol and that acetophenetidin is the safer because it yields the active principle more slowly. It is very probable that acetanilid is still used in excessive dosage and that it is a relatively safe drug, provided it is used in doses as small as

TABLE 2—'Dose-Price' Index of Hypnotics

Name	Average Dose Gm or Cc	Dose Price Index Unit	Frequency per 10,000 R
Chloral hydrate	0.5	1/2	44.3
Scopolamine hydrobromide	0.0006	3/4	1.3
Paraldehyde	2.0	3	2.4
Barbital	0.5	5	37.4
Phenobarbital	0.10	8	208.1
Sulfonethyilmethane	0.75	9	8.2
Ethyl carbamate (urethane)	2.0	10	
Sabromin	0.5	13	0.16
Pentobarbital sodium	0.1	15	
Carbromal (adalin)	0.3	16	5.9
Amytal	0.1	17	32.5
Amytal sodium	0.2	40	

0.1 Gm, which might be repeated every hour for two or three doses if required. It should be remembered in this connection that the coal tar analgesics are really merely antineuralgics, that they are not suitable for the relief of traumatic pain and that, if a moderate dose fails to relieve the pain, a larger dose is also likely to fail and may cause phenomena of intoxication. A relative efficiency test of acetanilid and acetophenetidin is decidedly in order. It might show that the "price-efficiency" index is even more favorable to acetanilid than 7 to 1, the "dose-price" index of table 3.

Of the pyrazolon derivatives, aminopyrine was used much more extensively (230 times in 10,000 R) than antipyrine (nine times). This is, no doubt, due to the fact that antipyrine is much more prone to produce untoward irritative phenomena—gastro-intestinal, respiratory, dermal. It is an interesting question which a "price-efficiency" study might settle, whether aminopyrine is really worth twenty-four times as much as acetanilid. If the latter is found as efficient in 0.1 Gm doses, its price advantage would be doubled and its toxic tendency lessened.

The older drugs labor under the disadvantage that they are known so well as to have all their faults known. The new and untried drugs come heralded as free from faults until, by tragic experience, some one discovers that their spotless reputation was due merely to lack of acquaintance with them. Witness the vicious tendency of cinchophen to produce hepatic atrophy or that of aminopyrine with or without barbiturate to cause neutropenia in certain cases. Entirely aside from this possibility, allonal (allylisopropyl barbituric acid with aminopyrine), with a "dose-price" index of 145, is certainly an uneconomical proprietary medicine; it should be taboo at least in charity hospitals.

The enormous use of codeine is due, of course, to its employment other than as analgesic. It is probably more extensively used as an antitussic ("cough-killer"). Entirely aside from the question of whether its use as an antitussic should not be greatly lessened, it might be stated without hesitancy that its use as an analgesic might be greatly restricted in hospitals, at least, in favor of morphine. In private practice, codeine has the advantage of being much less habit forming. This matter plays but a subordinate role in hospitals in which the supply of the drug is completely under control. Codeine is a relatively poor pain killer. Its analgesic efficiency

<sup>2</sup> Gathercoal, E. N. Prescription Ingredient Survey. Washington D. C. American Pharmaceutical Association 1933.

as compared with that of morphine is certainly much less than that suggested by the relation of their average doses (approximately 1:4). It is more nearly 1:8, and it is probably less than that. This would make morphine, which is still the "king of pain killers," at least eight times more economical than codeine. In the presence of severe (traumatic or inflammatory) pain, its use is much more humane. Why should a patient be allowed to suffer the excruciating pain of pleurisy—each breath like the stab of a knife in the side—when a hypodermic injection of morphine would promptly assuage it, whereas hardly any dose of codeine will.

As remedies for "rheumatic" pains the comparison between acetylsalicylic acid and neocinchophen might be in order. Even admitting that neocinchophen is a remarkably safe drug and much less liable to produce hepatic degeneration than cinchophen, is it worth twenty-four times as much as acetylsalicylic acid?

If the desired degree of remedial action can be increased by combination of drugs that produce a certain therapeutic effect by acting on different portions of a functional system (Burgis' rule), then combining the least expensive of each of the groups already discussed—namely, acetanilid, acetylsalicylic acid and morphine sulfate—in half the average official dose ought to produce a combination analgesic at once safe, potent and inexpensive. With this one might possibly give scopolamine hydrobromide to add its analgesic influence and to antagonize the diaphoretic tendency of the other agents.

#### ECONOMY IN DISINFECTANTS

Such studies as have been suggested for hypnotics and analgesics should be developed in all other directions. One more example will have to suffice here. The phenomenal commercial success of mercurochrome, which advertises itself by its color, has led enterprising manufacturers to push, by high pressure sales methods, other new disinfectants. Let it be understood that I am not finding fault with the remedies, the enterprise that produced them or the methods employed in their

TABLE 3—"Dose-Price Index of Analgesics"

Name	Dose Cm	Dose Price Index	Frequency per 10,000 P.
Acetanilid	0.20	Unit	23.1
Scopolamine hydrobromide	0.0006	3	1.3
Acetylsalicylic acid	0.30	4	453.8
Acetophenetidin	0.30	7	552.0
Antipyrine	0.20	12	9.1
Morphine	0.003	1	208.7
Aminopyrine	0.30	24	2.0
Opium	0.06	40	67.8
Phenobarbital	0.0	4	298.1
Codeine	0.0	6	1018.9
Neocinchophen	0.40	97	8.8
Allonal (allyl isopropyl barbituric acid with aminopyrine)	0.15	14	72.0

distribution. But somewhere, somehow, somebody needs to present all the facts in as impartial a manner as possible. In table 4 are the prices of probably equivalent skin disinfectants. The use of tax-free alcohol is figured on, as the alcohol used for the making of disinfectants should be purchased appropriately denatured.

It will be seen (table 4) that mercury bichloride (1:1000) is the cheapest of all disinfectants. It is odorless, does not spoil rubber gloves and for these reasons might be considered the most economical operating room hand disinfectant. A colored Harrington's solution, such as the tincture of mercury bichloride (9:1), yields a skin disinfectant that shows by its color where it has been applied at a vastly lower price than the colored proprietary disinfectants.

Saponated solution of cresol in 2 per cent dilution is another reliable disinfectant, cheap enough to be used as a solution for the hands. Its soapy slipperiness makes it the preferred disinfectant in obstetric and gynecologic examinations, and, because of its relative kindness to the skin, it is the favorite skin disinfectant in some hospitals for contagious diseases.

Trinitrophenol (picric acid), though powerful and relatively inexpensive, is perhaps somewhat too prone to cause an obstinate dermatitis in certain predisposed individuals to be recommended for general use.

TABLE 4—Relation of Prices of Skin Disinfectants

Name	Price Index
Mercury bichloride 1:1000	Unit
Compound cresol solution 2 per cent dilution	4
Picric acid, 5 per cent in 50 per cent alcohol	74
Mild tincture of iodine (U. S. P.)	15.5
Tincture of iodine diluted to half strength	25
Mercurochrome 2 per cent acetone in alcohol	599
Solution of merthiolate	900
Tincture of merthiolate	1,000
Tincture of metaphen	2,175

Iodine is the favorite skin disinfectant for the operative field. Tincture of iodine is too irritative for this purpose. Indeed, it was never designed for skin disinfection but intended as a rubefacient, for the production of counterirritation. Mild tincture of iodine (2 per cent) should be used in its stead for skin disinfection. Research<sup>3</sup> has shown that silk, a material which approaches the skin in chemical nature, absorbs much more iodine from aqueous iodine-iodide solutions than from alcohol or glycerin solutions of equal iodine strength. This is evidently because water, being the poorer solvent for iodine, gives it up to the tissue more readily than when the iodine is presented in a better solvent such as glycerin or alcohol. Karns, Cretcher and Beal<sup>4</sup> show that the amount of iodine deposited from a 3 per cent aqueous iodine-potassium iodide solution adhering to silk is ten times as great as from a solution of like strength in 70 per cent alcohol. If two fingers, immersed in the two solutions for from fifteen to thirty seconds, are washed with water, a considerable dose of iodine remains on the finger withdrawn from the aqueous solution, while the finger from the alcoholic solution is practically free from iodine. In clinical trials a solution of 2 per cent iodine strength has been found most satisfactory for the operating field.<sup>5</sup> It is applied in excess, allowed to remain in place for from fifteen to thirty seconds, and then removed with absorbent gauze or cotton. The solution in diluted alcohol of 2 per cent each of iodine and potassium iodide is now the official Mild Tincture of Iodine. For disinfection of the genitalia, iodine is generally considered too irritative. A mercury bichloride solution is to be preferred. Spraying application of the disinfectant should be considered as much more economical than application by gauze "sponges" which retain most of the disinfectant in their meshes. Rosenblatt<sup>6</sup> recommends it especially in gynecologic cases not only because of economy but also because of its more thorough distribution even to the interior of the cervix. James Raglin Miller recommends the spray as the most economical and efficient.

3. Karn, G. M. The Behavior of Iodine Solutions at Liquid-Solid Interfaces. *J. A. Pharm. A.* 21: 79, 82 (Aug.) 1932.  
4. Karns, G. M., Cretcher, I. H. and Beal, G. N. The Behavior of Iodine Solutions at Liquid-Solid Interfaces. *J. A. Pharm. A.* 21: 783, 787 (Aug.) 1932.  
5. LaWall, C. H. and Tice, I. F. A Pharmaceutical Study of Iodine Solutions for Antiseptic Use. *J. A. Pharm. A.* 21: 122, 125 (Feb.) 1932.  
6. Rosenblatt, Jakob. Eine Vereinfachung der grossischen Methode der Hautjodierung. *Zentralbl. f. Gynak.* 72: 2348 (Nov. 3) 1927.  
7. Miller, J. R. A Convenient Method for Cleaning the Vagina in Catheterization. *J. A. M. A.* 90: 292 (Jan. 28) 1924.

method for the application of any disinfectant solution in preparing the field of operation, whether it is laparotomy, delivery or any other surgical procedure

#### ECONOMY IN ANESTHESIA

The Golds<sup>8</sup> have shown that hospitals pay about six times as much for ether bought in one fourth pound cans as compared with the price of U S P ether in 27 pound drums. They have also shown that deterioration is by no means as rapid as surgeons have been led to believe. Hospital pharmacists might daily fill the small cans used in the operating rooms from drums of ether without any danger whatever (provided suitable precautions requisite for the handling of explosive liquids are taken) at a saving that might amount in almost any one of the large hospitals to several thousand dollars a year.

A great saving can also be effected by adopting the "closed circuit" system of administration of gas-oxygen or ethylene anesthesia as devised by Waters.<sup>9</sup> This consists in abolishing the exhalation valve and introducing a canister of soda lime between the mask and the breathing bag. This absorbs the carbon dioxide and permits the use of the anesthetic gas over and over again. Not only does it reduce greatly the cost of gas anesthesia but it is also claimed that the conservation of heat and moisture are of great value.

#### ECONOMY IN THE DRUG ROOM

While hospital pharmacists, no doubt, buy as economically as they can, it is not generally appreciated that many preparations which the hospital pharmacist purchases from the manufacturer could be prepared by him at a saving of at least 50 per cent at an average, and this includes in the calculation the expense of the pharmacist's time. In some cases as, for instance, in connection with "ephedrine inhalant," the saving may be somewhat in the proportion of 16 to 1.

The modern hospital pharmacist ought to be able and willing to prepare multiple dose ampules, i.e., sterile injection solutions put up in so-called vaccine vials. The National Formulary contains detailed directions for the preparation of these, and it is hoped that hospital pharmacists will avail themselves of them, for the high price of individual ampules is largely due to the enormous breakage that occurs in their manufacture and handling. The saving might easily amount to 90 per cent. A smaller but still considerable percentage of saving could be secured if pharmacists instead of buying hypodermic tablets would put up equivalent solutions ready for injection in multiple dose vaccine vials. At the same time hypodermic administration would be made so much more convenient to the nurse and when fractions of standard doses are prescribed, the remainder of the dose need not be wasted.

The amount of money that the pharmacist can save by his own exertion is small as compared with the money that can be saved by medicopharmaceutic cooperation. For instance, the preparation of capsules and of powders in divided doses is quite expensive in pharmaceutical labor as compared with the dispensing of tablets and that of powders in bulk. Whenever therefore, careful measuring of the dose is not required bulk powders should be prescribed. The patient can often adjust the dose of antacid powder or of cathartic saline required by him—which may vary from time to time—more successfully than the physician can estimate it.

Tablets should be prescribed whenever possible, provided they are so manufactured as to disintegrate readily. In large hospitals, a distinct saving of money can be achieved by the installation of a tablet machine, permitting the pharmacist to manufacture the tablets used in the hospital.

The matter of the economy of prescribing official rather than proprietary preparations has been so well and so thoroughly discussed during the last decade that space need not be taken here for this purpose. Table 5 may serve to show the economy of prescribing some of these chemicals by their nonproprietary name.

#### ECONOMY IN PLACEBOS

Finally, it should be pointed out that a great saving can also be secured by rational prescribing of placebos. It might be tactless to estimate the amount of medicine that is prescribed merely for its psychic effect on the patient. The modern tendency is, no doubt, away from the placebo. It is not only more economical, as well as more honest, but also often more efficient in the long run to employ skilled pure psychotherapy than medicine as the vehicle of indirect suggestion. It may, however, be impossible to get along entirely without placebos,

TABLE 5—Comparison of Prices of Identical Chemicals Under Different Names

Proprietary	Price 1 Oz	Chemical	Price 1 Oz
Phenacetin	\$0.63	Acetophenetidin	\$0.21
Pyramidon	0.82	Aminopyrine	0.47
Aspirin Bayer	0.75	Acetylsalicylic acid	0.13
Veronal	3.00	Barbital	0.54
Atoplan	2.75	Cinchophen	0.88
Urotropin	0.25	Metbenamine	0.16
Tolysin	2.00	Neocinchophen	1.01
Luminal (in ½ oz carton)	6.00	Phenobarbital	0.61
Aristol	1.80	Thymol iodide	0.43

and the lower the degree of the patient's intelligence the more he may be benefited by a placebo rather than by a preachment. He may indeed need both.

While it is poor policy to prescribe colored water or bread pills or anything else that is known to be absolutely inert, it is even worse to force the patient to spend a lot of money on intrinsically worthless but high priced medicines. Many millions of patients' money are annually wasted by the modern habit of prescribing of "vitamins" when none are needed, for they are altogether adequate in the ordinary everyday diet. Indeed prescribing expensive vitamins, when there really is a need for them, without simultaneously teaching the patient how to get along without the medicine by improving his diet, is failing in the duty of the physician. The fancy "tonics" that taste like "tipples" and act as such are still, in spite of the repeal of the eighteenth amendment, a large cause of useless expenditure of patients' money.

Who could calculate the millions of dollars that might be saved annually by "debunking" some of the polypharmaceutic mixtures. These medicines, containing in their formulas numerous entirely superfluous and inactive ingredients are generally the heritage of the ages, formulas conscientiously carried along by pharmacists who would not dare to delete any one of the ingredients because they believe the physician wants them, when in most instances the physician does not even know that these ingredients are there and neither he nor the patient would know it if they were not there. The thankless job of cleansing this Augean stable is hardly worth while undertaking, for these preparations will probably die their natural death in the near future. In

<sup>8</sup> Gold, Harry and Gold, David. Stability of U S P Ether After the Metal Container Is Opened. J. A. M. A. 102: 817 (March 17) 1931.  
<sup>9</sup> Waters, K. M. Carbon Dioxide Absorption from Anesthetic Mixture. California & West Med. 35: 342 (Nov.) 1931.



the meantime, it is best in the interest of economy to prefer simple to complex remedies.

If one wishes to prescribe a placebo, one might remember that iron and calcium are not very abundant in our daily food. One or the other of these might perchance be deficient and one or the other of them might be prescribed in inexpensive and inoffensive form, for example, as tablets of saccharated ferrous carbonate or of calcium lactate.

## MYASTHENIA GRAVIS

### CONSIDERATION OF RECENT ADVANCES AND INFLUENCE OF PREGNANCY REPORT OF CASE

HARRY TABACHNICK, M.D.

WILWAUKEE

The etiologic knowledge of myasthenia gravis is as yet incomplete, and the finger of suspicion is still directed at the endocrines. However, clinical insight relative to symptomatic therapy and diagnosis of this disease has progressed rapidly since 1934.

#### RECENT ADVANCES PERTAINING TO ETIOLOGY

In 1934 Nevin,<sup>1</sup> concerned with muscle chemistry in myasthenia gravis, concluded that the myoneural junction would be the location of clue to more lucid understanding of the etiology and treatment of the disease. The work of Dale and Feldberg<sup>2</sup> indicated that normal excitation transmission at the myoneural junction depends on the liberation of acetylcholine.

The work of Pitfield<sup>3</sup> and of Simon<sup>4</sup> reported in 1935 and of Kennedy and Wolf<sup>5</sup> in 1937 seemed to incriminate the endocrines for the dysfunction of acetylcholine at the myoneural junction. It was found, for example, that insulin improved myasthenia as did ephedrine and epinephrine, whereas thyroid and thymus exaggerated its symptomatology. Kennedy and Wolf concluded among other things that endocrine disorder, little understood, is at work in this disease.

#### RECENT ADVANCES IN THE TREATMENT

Within the past three years the treatment of myasthenia gravis has advanced remarkably. Therapy has kept pace with the better understanding of the mechanism of excitation transmission at the myoneural junction. Walker in 1934<sup>6</sup> first reported a case of myasthenia which by the use of physostigmine was definitely improved. In the following year she<sup>7</sup> demonstrated before the clinical section of the Royal Society of Medicine the improvement that occurred in one case with the use of prostigmine, an analogue of physostigmine. Since this original observation there has been no derogating evidence on the action and efficacy of prostigmine in the treatment of myasthenia gravis. Walker demonstrated that a subcutaneous

injection of 2.5 mg of prostigmine was followed by disappearance of ptosis and ophthalmoplegia within five minutes. Maximum effect was obtained in one hour, and in from six to eight hours there was a gradual return to the weakened state.

Walker advocated intramuscular injection in single doses of from 3 to 5 cc of a 1:2,000 solution, the equivalent of from 15 to 25 mg, combined with atropine sulfate, once a day, at intervals of several days. Atropine was given to counteract the sometimes severe intestinal cramps and bradycardia that ensued.

Observations on prostigmine used orally were reported by Everts<sup>8</sup> in 1935 and by Laurent and Walker<sup>9</sup> in 1936. The latter noted that from 25 to 30 mg gave a result comparable to the subcutaneous injection of 0.5 mg. When it was thus administered improvement occurred within forty minutes, with reaction of maximum intensity at the end of two hours. The maximal reaction persisted for from six to eight hours and gradually subsided. After several months of treatment there was no detectable exaggeration of symptoms.

The influence of prostigmine by injection disappears in about five hours and for this reason Winkelman and Moore<sup>10</sup> in 1937 advocated the giving of smaller doses two or three times a day similar to the manner in which insulin is administered in cases of diabetes. Prostigmine thus given permits chewing, swallowing and some degree of useful activity on the part of the patient.

#### RECENT ADVANCES IN DIAGNOSIS

Pharmacologic evidence garnered from the work of Stavratsky<sup>11</sup> with the drug quinine and that of Sollmann<sup>12</sup> with the drug physostigmine led Kennedy and Wolf to conclude that prostigmine is effective in myasthenia through its catalytic influence on acetylcholine at the myoneural junction, an effect pharmacologically opposed to that of quinine at this location. Quinine therefore is as effective in myotonia as is prostigmine in myasthenia. These two entities are clinical opposites. From the foregoing it is logical to deduce that in diagnosis of myasthenia gravis the giving of quinine would be expected to exaggerate the clinical picture.

There are many instances in which the diagnosis of myasthenia is difficult to establish. Harvey and Whitehill,<sup>13</sup> reporting in April 1937, considered prostigmine of value in the diagnosis of myasthenia. They observed that in nine cases with fairly definite clinical pictures an injection of prostigmine was followed by a promptly striking response. In one doubtful case there was no response. In a group of thirteen other neurologic disorders wherein muscle abnormalities or cranial nerve palsies were present, there was no immediate response to prostigmine.

Attention was again called to the use of prostigmine as a diagnostic test by Gammon and Schere,<sup>14</sup> who in

From the Neurological Clinic, Mount Sinai Hospital Dispensary and Department of Neurology, Marquette University Medical School.

<sup>1</sup> Nevin, Samuel. Study of Muscle Chemistry in Myasthenia Gravis. *Brain* 57: 239-254 (Oct.) 1934.

<sup>2</sup> Dale, H. H. and Feldberg, W. The Chemical Transmission of Secretory Impulses to the Sweat Glands of the Cat. *J. Physiol.* 82: 121-128 (Aug. 24) 1934.

<sup>3</sup> Pitfield, R. L. Use of Insulin in Myasthenia. *Tubercule* 5 and Other Disorders of Nutrition. *N. Rec.* 141: 328-331 (April 3) 1935.

<sup>4</sup> Simon, H. E. Myasthenia Gravis. Effect of Treatment with Anterior Pituitary Extract. Preliminary Report. *J. A. M. A.* 104: 2062-2066 (June 8) 1935.

<sup>5</sup> Kennedy, F. O. and Wolf, Alexander. Experiments with Quinine and Prostigmine in Treatment of Myotonia and Myasthenia. *Arch. Neurol. & Psychiat.* 37: 68-74 (Jan.) 1937.

<sup>6</sup> Walker, Mary B. Treatment of Myasthenia Gravis with Physostigmine. *Lancet* 1: 1200-1201 (June 2) 1934.

<sup>7</sup> Walker, Mary B. Case Showing the Effect of Prostigmine on Myasthenia Gravis. *Proc. Roy. Soc. Med.* 28: 29 (April) 1935.

<sup>8</sup> Everts, W. H. The Treatment of Myasthenia Gravis by the Oral Administration of Prostigmine. *Bull. Neurol. Inst. New York* 4: 573-580 (Dec.) 1935.

<sup>9</sup> Laurent, L. P. E. and Walker, Mary B. Oral and Parenteral Administration of Prostigmine and Its Analogues in Myasthenia Gravis. *Lancet* 1: 1457-1459 (June 27) 1936.

<sup>10</sup> Winkelman, N. W. and Moore, M. T. Prostigmine in the Treatment of Myasthenia Gravis and Muscular Dystrophy. *Arch. Neurol. & Psychiat.* 37: 237-250 (Feb.) 1937.

<sup>11</sup> Stavratsky, G. W. Effect of Quinine on Parasympathetic Sympathetic Innervation of the Salivary Gland. *J. Pharmacol. & Exper. Therap.* 47: 321-338 (March) 1933.

<sup>12</sup> Sollmann, Terald. A Manual of Pharmacology, ed. 5. Philadelphia: W. B. Saunders Company, 1936, p. 342.

<sup>13</sup> Harvey, A. M. and Whitehill, M. R. Prostigmine as an Aid in the Diagnosis of Myasthenia Gravis. *J. A. M. A.* 105: 1372-1333 (April 17) 1937.

<sup>14</sup> Gammon, C. D. and Schere, Harold. Use of Prostigmine as a Diagnostic Test of Myasthenia Gravis. *J. A. M. A.* 109: 413-414 (April 7) 1937.

August 1937 reported a study including cases of myotonic dystrophy, family periodic paralysis, amyotonia congenita and myasthenia gravis and normal individuals. They observed that prostigmine, in doses ordinarily employed in treating myasthenia gravis, sets up marked fibrillary tremors in the muscles of normal persons and in all cases of muscular disease except myasthenia. The twitchings, though generalized, were most observable in the eyelids and tongue. It was evident also that prostigmine exaggerated the weaknesses in all cases except the myasthenic. From their studies Gammon and Scheie concluded that prostigmine appears to be specific for myasthenic weakness and that it may possibly find its greatest usefulness in the differentiation of myasthenia from other entities with muscular weakness.

#### INFLUENCE OF PREGNANCY

Interest in the undetermined etiologic role of the endocrines is further enhanced by the consideration of myasthenia gravis associated with pregnancy. In 1906 Sir Farquhar Buzzard<sup>15</sup> observed symptomatic fluctuations in myasthenia during pregnancy. In 1907 Tilney<sup>16</sup> observed myasthenia gravis begin during pregnancy. In 1924 Grosse<sup>17</sup> reported a case in which symptoms first developed during pregnancy and recovery took place after induction of premature labor. In Cecil's textbook<sup>18</sup> there is the statement that symptoms of the disease often disappear during pregnancy. Stevens<sup>19</sup> mentions the puerperal state as an etiologic factor in the disease. Laurent<sup>20</sup> in 1931 reported the case of a woman with myasthenia who was observed through seven pregnancies, in two of which she manifested remissions, in five subsequent ones she suffered relapses. Wechsler<sup>21</sup> states that myasthenia more often affects females than males.

#### REPORT OF CASE

Mrs. Z. B., white, aged 37, weighing 138 pounds (62.6 Kg.) the mother of four children, first seen May 20, 1936, in the neurologic clinic of the Mount Sinai Dispensary, stated that since childbirth one year before she had been conscious of an easy tendency to fatigue and marked generalized weakness. Her remote past history was irrelevant as was her family history. The neurologic examination revealed no organic defect. Studies of the blood urine and basal metabolic rate previously done in the clinic, were negative. A working diagnosis of neurocirculatory asthenia or neurasthenia was made and she was placed on ephedrine sulfate three-eighths grain (0.02 Gm.) three times a day. At the next visit a month later, she reported marked increase in strength and vigor. On each of the following monthly visits the same report on improvement was obtained and in September 1936 the dose of ephedrine was reduced to three eighths grain once daily because of complaint of sleeplessness. In November 1936 a small dose of phenobarbital to be taken at bedtime was prescribed and she was directed to take the one dose of ephedrine early in the day. At this visit she offered the additional information that she had been induced by her friends to visit a well known North American clinic, where she was told that she was nervous.

She was not seen again in the clinic until Sept. 8, 1937, at which time, by interim history taking it was ascertained that in the previous July she had been hospitalized for several days after having suffered a fall. The hospital record of this stay

revealed no mention of physical defect save a minor head contusion. However, she was suspected of having some form of myopathy, for which she was given aminoacetic acid while in the hospital. There were apparently no suggestions of myasthenic facies at that time. On this visit to the clinic, when questioned regarding the fall, she explained that it had occurred after climbing a few stairs, when she became dizzy and her knees seemingly gave way. Further interim history revealed that for three months she had been experiencing greater fatigue and weakness than ever before, plus difficulty with chewing and swallowing food. She stated that she very frequently choked over food and therefore had to limit her food to small quantities of liquids. On neurologic examination it was found that the voice was weak and of peculiar nasal tone. The speech seemed labored and thick. She presented the typical myasthenic facies with bilateral ptosis and appearance of facial diplegia. Ophthalmoplegic signs consisted of inability to direct the eyes upward above a horizontal plane and limitation in movement of the eyes on looking to the sides. To complete the scope of vision she compensated by tilting the head upward or rotating it sideways. There was generalized weakness but no paralysis, atrophy or sensory defect. A diagnosis of myasthenia gravis was made and she was hospitalized at Mount Sinai Hospital for a study with prostigmine.

In the hospital she gave a history of amenorrhea of four months' duration and the gynecologist on service noted that the uterus was increased to the size of a four months pregnancy. The Aschheim-Zondek test was positive. Studies of the basal metabolic rate and the blood inclusive of blood chemistry were negative save for moderate secondary anemia, which was attributed to past inability to eat and to pregnancy.

Before the evening meal on her second day in the hospital the first dose of prostigmine methyl sulfate<sup>22</sup> consisting of 2 cc of a 1:2,000 solution was administered. Within ten minutes a spectacular change in her appearance was observed. The ptosis disappeared. There was a return of expressive personality in the facial appearance. She was able to gaze at the ceiling of the room without tilting the head upward. She was able to rise to the sitting position in bed without the necessity for support of the head. She partook of solid food with enthusiasm, exclaiming with an increasingly strong tone of voice that it was her first enjoyable meal in months. She thereafter talked almost incessantly for two hours and was seemingly overjoyed at the sudden return of her former vigor. The influence of this injection of prostigmine methyl sulfate was dissipated in five hours. At the time of writing of this report (Oct. 15, 1937) she was receiving 2 cc of prostigmine methyl sulfate fifteen minutes before each meal.<sup>23</sup>

#### SUMMARY AND CONCLUSIONS

In a case of myasthenia gravis, myasthenic weakness had its onset after childbirth, and the myasthenic facies with exaggeration of symptoms was observed to set in during the early course of the next pregnancy.

Myasthenic weakness may precede the myasthenic facies.

Prostigmine is a valuable drug in both treatment and diagnosis of myasthenia gravis. It is suggested that prostigmine may be of aid in the diagnosis previous to the onset of the myasthenic facies, that is, when the malady is in what may be termed a stage of incipience.

There is need for more determinate information on myasthenia gravis with pregnancy. An accumulation of data including use of the newer quantitative endocrine determinations is likely to assist in clarifying the possible relationship of the endocrines to the disease.

606 West Wisconsin Avenue

15 Buzzard Farquhar cited by Kennedy and Wolf.<sup>3</sup>

16 Tilney Frederick Neurographs 1:20-46 1907

17 Grosse A. Bull. Soc. d'obst. et de gynec. 13:106 1924

18 Cecil R. L. A Text Book of Medicine ed. 3 Philadelphia W. B. Saunders Company 1935 p. 1396

19 Stevens A. V. Practice of Medicine ed. 2 Philadelphia W. B. Saunders Company 1928 p. 953

20 Laurent L. P. E. Remissions and Relapses Associated with Pregnancy in Myasthenia Gravis. Lancet 1:753-754 (April 4) 1931

21 Wechsler I. S. A Text Book of Clinical Neurology ed. 2 Philadelphia W. B. Saunders Company 1931 p. 201

22 Dimethylcarbamate ester of m-oxypheyl trimethylammonium methyl sulfate

23 Since this paper was submitted for publication administration of prostigmine was changed from the subcutaneous to the oral route with somewhat better result. Since Nov. 15, 1937, this patient has been receiving two tablets 30 mg. of prostigmine bromide (dimethylcarbamate ester of m-oxypheyl trimethylammonium bromide) about thirty minutes before meals. Prostigmine tablets for use in this case were the donation of Hoffmann-La Roche, Inc., Nutley, N. J.

SODIUM THIOSULFATE AND THE  
ELIMINATION OF ARSENIC

SAMUEL AYRES JR, M.D.

AND

NELSON PAUL ANDERSON, M.D.

LOS ANGELES

The administration of sodium thiosulfate for the treatment of arsenical dermatitis has been an accepted procedure among dermatologists ever since it was first introduced by Ravaut,<sup>1</sup> in 1920. In this country McBride and Dennie<sup>2</sup> confirmed the value of the treatment, and since then numerous clinicians have attested its value in shortening the duration and lessening the severity of arsenical eruptions, especially postarsphenamine dermatitis. A number of investigators<sup>3</sup> have shown that the administration of sodium thiosulfate orally or intravenously causes a prompt and pronounced increase in the elimination of arsenic, followed in the course of several weeks by a gradual diminution in the output of urinary arsenic, to the point where only traces or none at all can be detected, although it must be admitted that carefully compiled statistical studies have not been numerous. Some conflicting reports, however, have appeared, notably those of Young<sup>4</sup> and of Mattice and Weisman.<sup>5</sup> Moore<sup>6</sup> in his textbook on the treatment of syphilis, made the rather dogmatic statement that he had seen no evidence that the drug is of any value whatever.

Sulzberger and Goodman,<sup>7</sup> in their annual review of allergy in dermatology in a recent issue of the *Journal of Allergy*, apparently accepted the conclusions of Mattice and Weisman as the last word on the subject when they stated:

It seems that still another fallacy regarding arsenic excretion has been uncovered by Mattice and Weisman, who demonstrated that far from increasing arsenic excretion, the administration of sodium thiosulfate actually decreased the urinary output of the metal. Inasmuch as no satisfactory clinical proof of the efficacy of sodium thiosulfate in the therapy of arsenical dermatoses has been adduced, it would seem that, in the light of these new experimental findings, the drug may actually do harm rather than good.

Such diametrically opposed points of view seem to call for a reappraisal of the entire subject. A matter of this sort is susceptible of quantitative investigation. It would appear unfortunate therefore that Sulzberger and Goodman should accept the conclusions of Mattice and Weisman as definitive in the face of a considerable volume of clinical and experimental evidence to the contrary, especially since Mattice and Weisman drew their conclusions from observation of only four patients of whom none were suffering from arsenical dermatitis and one was not even suspected of having an arsenical disorder.

We have for a number of years been interested in the subject of arsenic as an etiologic factor in certain disorders of the skin and have made a practice of regularly testing the urine for arsenic before and immediately after the injection of sodium thiosulfate in all cases of suspected arsenical causation with the exception of cases of frank postarsphenamine dermatitis, of which we have fortunately seen but few during recent

## Influence of Sodium Thiosulfate on the Urinary Excretion of Arsenic

Diagnosis	Case	Arsenic Before Sodium Thio-sulfate	Arsenic After Sodium Thio-sulfate	Subsequent Test
Arsenical keratosis of palms and soles associated with multiple benign superficial epitheliomas	1	0.0039	0.0037	
	2	Negative	0.0013	
	3	0.0319	Trace	
	4	0.0259	0.0240	
	5	Trace	0.010	
	6	0.0377	0.0130	
	7	0.0312	0.010	
	8	0.0230	0.0100	After 40 days 0.010 after 1 year, 0.010
	9	Negative	0.0079	
Scleroderma (morphoid)	10	Negative	Negative	
Dermatomyositis	11	0.0018	0.0320	After 18 days 0.010 after 29 days 0.0019 after 70 days 0.0015
Vitiligo	12	0.0058	0.0051	
Widespread eczematous eruptions or typical exfoliative dermatitis	13	0.0120	0.0600	After 7 days 0.0102 after 39 days 0.0040 after 7 months 0.0001
	14	0.0192	0.1570	
	15	0.0110	0.4120	
	16	Negative	0.1440	After 11 months negative
	17	0.0493	0.2920	
	18	0.0038	0.0501	After 30 days negative
	19	0.0092	0.0670	
	20	0.0110	0.0960	
	21	0.0730	0.200	After 21 days 0.0119 After 29 days 0.010 after 80 days 0.00 after 7 months 0.00
	22	0.0240	0.200	
	23	Negative	Negative	
	24	Negative	0.7200	After 26 days 0.0011
	25	Negative	0.0020	
	26	Negative	Negative	
	27	0.0135	0.210	
	28	0.0018	0.0017	
	29	Negative	0.0144	
	30	0.0034	0.0180	After 22 days 0.010 after 68 days 0.010
Exfoliative dermatitis alternating with dermatitis herpetiformis	31	0.0074	0.0011	
	32	Negative	0.0101	
Eczematous eruptions of undetermined origin and of less extensive distribution	33	Negative	0.0180	
	34	0.0470	0.0210	
	35	0.0010	0.0001	
	36	0.0010	Negative	
	37	0.0192	0.0810	
	38	0.0096	0.0210	
Hyperkeratotic eruptions of palms and soles	39	0.0100	0.0100	After 74 days 0.0019 After 59 days negative
	40	0.0068	0.1670	
Dermatitis venenata (proved by patch tests)	41	Negative	Negative	
	42	0.0090	0.1010	After 4 months 0.0014
	43	Negative	0.0149	
Eczema (generalized)	44	0.0120	0.140	Had received from ergocalciferol once a week for a year prior to months before first visit
Alopecia areata	45	Negative	0.0120	
	46	0.0102	0.0174	
	47	0.0042	0.150	After 21 months 0.011
	48	0.0090	0.010	After 2 months 0.01
	49	0.0050	0.170	

The Gutzeit test with control was used in all determinations.  
 † Urinary arsenic expressed in milligrams of arsenic per hundred grams of solids at the time of the patient's first visit.  
 \* Arsenic in the urine collected immediately after the intravenous injection of 1 Gm. of sodium thiosulfate in 10 cc. of distilled water.

years. We admit the validity of the conclusions of Mattice and Weisman<sup>5</sup> to the effect that the excretion of arsenic even by clinically normal persons is subject to considerable variation from day to day and we also admit that the mere finding of a small amount of arsenic in the urine does not prove that the clinical disorder in question is due to arsenic.

1 Ravaut P. Internal Treatment of Skin Disease. Pres. med. 28 73 (Jan. 28) 1920.

2 McBride W. L. and Dennie C. C. Treatment of Arsenical Dermatitis and Certain Other Metallic Poisoning. Arch. Dermat. & Syph. 7 63 (Jan.) 1923.

3 Kuhn H. A. and Reese H. H. Sodium Thiosulfate in the Treatment of Metallic Intoxication. J. A. M. A. 85 1804 (Dec. 3) 1925. Groehl M. R. and Myer C. N. Sodium Thiosulfate in the Treatment of Dermatitis and Jaundice as a Result of Metallic Intoxication. Therap. Gaz. 48 691 (Oct. 15) 1924.

4 Young A. G. Studies of the Action of Sodium Thiosulfate in Metallic Intoxications. J. Lab. & Clin. Med. 13 622 (April) 1928.

5 Mattice M. R. and Weisman Donald. Urinary Excretion of Arsenic. II. The Influence of Thiosulfate. Am. J. M. Sc. 192 420 (March) 1937.

6 Moore Joseph Earle. The Modern Treatment of Syphilis. Springfield, Ill. Charles C. Thomas Publisher 1933. p. 159.

7 Sulzberger M. B. and Goodman Joseph. Allergy in Dermatology. A Critical Review of Some Recent Contributions. J. Allergy 8 335 (May) 1937.

8 Mattice M. R. and Weisman Donald. Urinary Excretion of Arsenic in a Normal Subject. Am. J. M. Sc. 192 413 (March) 1937.

We are not presenting this paper with the thought of assigning an arsenical causation to the various disorders enumerated in the accompanying table but with the sole object of offering concrete evidence of the definite and constant action of sodium thiosulfate in causing an increased elimination of urinary arsenic. In the cases in which subsequent determinations were made, a definite curve could be plotted showing a gradual increase in the excretion of arsenic during continued administration of sodium thiosulfate, followed by a fall in the output, frequently to zero. In answer to the possible criticism that we made only one determination prior to the injection of sodium thiosulfate, we would merely point out that the second determination, made immediately after the injection, showed a larger amount than the first except in a few cases, in which no arsenic was found at all, and we feel that our series of cases is sufficiently large to afford validity to our results.

Our technic has been as follows. The patient is given a sterile quart glass jar with a glass top (in order that no metal which might possibly contain arsenic may come in contact with the urine) and is instructed to fill the jar with portions of each urination over a twenty-four hour period. When this is brought back he is instructed to empty his bladder, is given 1 Gm of sodium thiosulfate in 10 cc of sterile distilled water intravenously and is then instructed to urinate directly into a second jar until it is filled rather than to use samples over a twenty-four hour period.

Thus the second jar contains the first output of any arsenic that may be released by the injection of sodium thiosulfate. Both specimens are then tested by the Gutzeit<sup>9</sup> method with a control. This test, which probably is the best method for the determination of arsenic in the urine, depends on the development of a yellow to brownish color in a strip of sensitized paper as the result of contact with volatile arsine gas or hydrogen arsenite ( $\text{AsH}_3$ ), which is liberated through the chemical interaction of dilute hydrochloric acid, zinc and urine which has been concentrated by partial evaporation. By comparison with color standards, the amount of arsenic present can be estimated according to the length of the band of color and its intensity. All of the reagents must be arsenic free, and to avoid the possibility of false reactions a control should accompany each test.

With few exceptions, the specimen of urine collected immediately after a single injection of sodium thiosulfate has shown a definite and in some cases a marked increase over the first specimen. A number of investigators have insisted on the necessity of using the fresh crystals of sodium thiosulfate, which are to be dissolved just prior to administration, but we have never felt that sufficient proof exists of the superiority of this preparation over the ampules of sodium thiosulfate in solution, and we have always used the latter.

#### SUMMARY OF TABLE

Arsenic determinations were made on the urine of forty-nine patients with a variety of cutaneous disorders in whom arsenic was suspected of being a possible etiologic factor. The tests being made before and immediately after a single injection from an ampule of a stable solution of 10 cc of 10 per cent sodium thiosulfate. Of these, 8 per cent failed to show any arsenic either before or after injection, 12 per cent showed a decrease in the output of arsenic after the injection.

Eighty per cent showed an increase in the excretion of arsenic, in some cases a hundred times as much as was excreted at the second test as at the first test, and the increase was seldom less than tenfold. It may be noted that in some cases in which subsequent determinations were made during the course of administration of sodium thiosulfate there was a further increase in the excretion of arsenic and that in all such cases there was a gradual decline in excretion, probably indicating that arsenic which had been stored in the tissues had been eliminated.

These are unselected cases and represent all of the cases which we have investigated in this manner during the past four years.

#### CONCLUSIONS

A statistical study of forty-nine cases of various dermatologic conditions in which arsenic was suspected of being a causative factor and in which arsenic determinations were made on the urine before and immediately after a single injection of sodium thiosulfate demonstrates clearly that an increase in the excretion of urinary arsenic usually follows the injection of sodium thiosulfate.

2007 Wilshire Boulevard

### *Clinical Notes, Suggestions and New Instruments*

#### ANAEROBIC BETA HEMOLYTIC STREPTOCOCCUS MENINGITIS OF OTITIC ORIGIN TREATED WITH SULFANILAMIDE AND CULMINATING IN COMPLETE RECOVERY

FRED W. SMITH, M.D., PHILADELPHIA, KARL F. MAYER, M.D.,  
GLENSIDE, PA., HORST A. AGERTY, M.D., UPPER DARBY, PA.,  
RUSSELL H. FOWLER AND WILLIAM C. LAYTON, M.D.,  
ABINGTON, PA.

Although the number of patients who have recovered from meningitis caused by the beta hemolytic streptococcus after treatment with sulfanilamide appears to be growing rapidly, we are able to report for the first time, to our knowledge, a case of meningitis caused by an anaerobic beta hemolytic streptococcus with recovery under sulfanilamide therapy.

#### REPORT OF CASE

E. B. S., a white girl, aged 21, first seen by one of us July 29, 1937, complained of sore throat and backache. The past personal and family histories were noncontributory. The temperature was 103.4 F and the throat was acutely inflamed and covered with numerous white patches. A culture was taken and the following day was reported as showing a few pneumococci, *Streptococcus viridans* and *Micrococcus catarrhalis*. In the meantime she had been given 10 grams (0.65 Gm) of sulfanilamide three times a day. This was discontinued the following day after we received the bacteriologic report on the culture of material taken from the throat, and a slight cyanosis developed. The throat infection had practically subsided and the temperature had returned to normal by August 1. August 2 an acute otitis media developed on the left side and adequate drainage was secured within twenty-four hours by a myringotomy performed by an otologist. No culture was taken of the discharge. There was a rapid progressive improvement in her condition and within ten days the discharge had gradually ceased and the temperature was normal. The patient was symptom free and went to the seashore to recuperate.

August 17 she returned from the shore with an acute exacerbation of all symptoms. The left ear was discharging and she complained of intensive supra-orbital and temporal headache on the left side. Examination revealed a profuse pulsating sero-

Dr. Smith died Feb. 20, 1938.

Dr. Fowler and Dr. Layton are members of the resident staff of Abington Memorial Hospital.

Dr. John Eiman, pathologist of the Abington Memorial Hospital and director of the laboratories, cooperated heartily in this case.

<sup>9</sup> Autenreith, Wilhelm. Detection of Poisons, ed. 4, translated by William H. Warren. Philadelphia: P. Blakiston's Son & Co., 1915, p. 233.

purulent discharge from the left canal with a sagging of the superior and posterior canal walls and slight tenderness over the mastoid tip. The temperature was 102 F, and she had considerable nuchal rigidity but no other neurologic manifestations at that time.

She was admitted to the Abington Memorial Hospital August 18 for operation, with a diagnosis of acute mastoiditis on the left side. On admission she was drowsy and the deep reflexes were somewhat accentuated. Otherwise her condition and manifestations were as already noted. The temperature was 103.2 F, pulse rate 120, respiratory rate 32. The leukocyte count was 13,800 cells per cubic millimeter, with 88 per cent polymorphonuclears. The blood cultures grown in hormone and brain broths showed no growth. Preoperative roentgenograms by Dr. J. Donald Zulick to determine whether the petrous pyramid was involved showed no evidence of involvement of the petrous pyramid but showed incomplete occlusion of the

cent polymorphonuclears, the temperature varied slightly but remained between 99 and 100 F. The results of neurologic and ophthalmoscopic examinations were negative, and the wound was redressed and found to be in a satisfactory condition. By August 26 the leukocyte count had returned to normal and, although the headache was variable, it persisted and did not yield to ordinary measures.

August 27, the tenth postoperative day, the temperature suddenly went up to 103.2 F and the white count rose to 14,600 with 88 per cent polymorphonuclears. There were present at that time nuchal rigidity, diplopia, accentuation of the deep reflexes, a positive Kernig sign and a positive Brudzinski sign. Fifteen cc of prontosil was given intramuscularly every eight hours. August 28 a spinal tap was done and 16 cc of turbid fluid was removed under 360 mm of water pressure. After removal of 16 cc of spinal fluid the closing pressure was 180 mm of water. The initial spinal fluid examination showed

### Spinal Fluid Analysis

Date	Quantity Cc	Pressure*	Appearance	Cell Count	Differential	Sugar†	Chlorides†	Globulin	Smear	Culture
8/23	16	360	Turbid	360	100% polymorphonuclears			Increased	Occasional gram positive diplococci and short chains	Anaerobic beta hemolytic streptococcus
8/29	15	450	Cloudy	1800	94% polymorphonuclears 5% mononuclears	10	618	Increased	Occasional gram positive diplococci and short chains	Anaerobic beta hemolytic streptococcus
8/30	10	290	Slightly cloudy	1500	73% polymorphonuclears 22% mononuclears 5% lymphocytes		660	Increased	Occasional gram positive diplococci	Anaerobic beta hemolytic streptococcus
8/31	6	180	Mildly turbid	610	78% polymorphonuclears 22% mononuclears	20	648	Increased	No organisms	No growth
9/1	12	240	Turbid	1900	79% polymorphonuclears 18% lymphocytes 3% mononuclears	43	678	Markedly increased	1 pair gram positive diplococci	No growth
9/2	15	300	Slightly cloudy	380	39% polymorphonuclears 59% lymphocytes 2% monocytes			Increased	No organisms	No growth
9/3	10	290	Slightly cloudy	343		41	700	Increased	3 pairs gram positive diplococci	No growth
9/4		270	Slightly cloudy	300				Increased	No organisms	No growth
9/5	12	230	Slightly hazy	116	5% polymorphonuclears 91% lymphocytes 4% large mononuclears			Increased slightly	No organisms	No growth
9/6	10	240	Clear	174	20% polymorphonuclears 80% lymphocytes	58	730	Increased slightly	No organisms	No growth
9/7		290	Clear	118	6% polymorphonuclears 93% lymphocytes 1% monocytes			Increased	No organisms	No growth
9/9	8	160	Clear	57	100% lymphocytes	58	724	Increased slightly	No organisms	No growth
9/11	8	175	Clear	50	100% lymphocytes	59	710	Increased slightly	No organisms	No growth
9/15	6	140	Clear	9	100% lymphocytes	64	730	Increased slightly	No organisms	No growth

\* Millimeters of water pressure

† Milligrams per hundred cubic centimeters of spinal fluid

Gram positive diplococci were seen on smear but the cultures grown both aerobically and anaerobically were sterile. We believe that the sterile cultures resulted from either the germicidal or the bacteriostatic effect of sulfanilamide in the spinal fluid.

cells on the left side with a coalescence of the mastoid cells that lie over the sinus.

August 19 a simple complete mastoidectomy was done on the left side. There was no exposure of the dura or sinus and no evidence of a pathologic condition of the bone extending into any portion of the petrous bone. Culture of material from the mastoid, grown aerobically, showed no growth, while the smear showed many pus cells but no bacteria. Clinically it was a typical hemolytic streptococcus infection. Within the first twenty-four hours the patient was given two prophylactic intramuscular injections of 15 cc of the disodium salt of 4-sulfamidophenyl-2'-azo 7'-acetylaminio-1'-hydroxynaphthalene-3, 6' disulfonic acid (prontosil).

The immediate postoperative condition of the patient was good and improvement was rapid. The headache and nuchal rigidity disappeared entirely within the first few days and the temperature came down by lysis and was essentially normal by the third postoperative day (August 22). The results of all neurologic examinations were negative, and a satisfactory convalescence seemed to be established.

On the fifth postoperative day (August 24) a frontal headache developed. The leukocyte count was 12,500 with 88 per

cent polymorphonuclears, all polymorphonuclear. The globulin was increased. Smear showed occasional gram positive cocci in pairs and in short chains. Culture showed anaerobic beta hemolytic streptococci. A blood culture taken August 28 showed no growth after five days of both aerobic and anaerobic incubation. The prontosil was increased to 30 cc every eight hours.

August 29 the patient's status was about the same. During the previous night the temperature had been up to 104.4 F. The case was seen in consultation from a neurologic standpoint, with Dr. J. R. VanMeter, in order to detect any evidence of a lateral sinus thrombosis or localized collection of extradural pus, which might make it necessary to revitalize the operative field. Such was not found to be the case, and the diagnosis of a purulent meningitis of otitic origin was confirmed. It was decided to rely entirely on sulfanilamide by oral administration.

1 The dose of sulfanilamide was regulated by the patient's clinical condition because at the time this patient was under treatment we did not have the facilities that are now available at the hospital for the determination of the concentration of sulfanilamide in the blood stream. The drug was continued after cyanosis developed because of the marked improvement in the clinical condition and because of the probable fatal outcome if the drug was stopped.

since the concentration of this drug in the cerebrospinal fluid is only slightly less than that in the blood. The patient was given a total of 60 grains (4 Gm) a day, administered 10 grains (0.65 Gm) every four hours. The weight of the patient was about 110 pounds (49.9 Kg).

On the following day the temperature came down to normal. It remained normal during the remainder of the illness except for one day (August 31) when, because of cyanosis, two doses of the sulfanilamide were omitted. At that time the temperature rose to 102.4 F. The drug was immediately resumed, despite the cyanosis, which persisted during the remainder of the administration of the drug. The temperature immediately returned to normal. It is evident from the accompanying table that with this brief omission of sulfanilamide therapy the patient's symptoms became more pronounced and the spinal fluid changes were more strongly positive.

Under the sulfanilamide therapy and a daily spinal tap, the patient's condition improved rapidly. At no time was she disoriented or uncooperative. Following the onset of the sulfanilamide therapy the patient was quite comfortable, except for pain and tenderness at the site of the prontosil injections. Except for some diplopia and left convergent squint the results of neurologic examinations were negative by September 6, the eleventh day of the meningitis. The diplopia gradually disappeared, as did the associated left convergent squint. The results of ophthalmoscopic examinations were consistently negative. No evidence of lateral sinus thrombosis was present at any time.

The spinal fluid improved consistently, as shown in the table. Two transfusions of 200 cc each were given to maintain the hemoglobin and erythrocytes near a normal level. Daily complete blood and Schilling counts were done. The leukocyte count was normal after August 31. The hemoglobin ranged from 10 to 12.5 Gm. The erythrocytes ranged from 3,550,000 to 4,800,000.

Blood chemistry, including tests for urea, sugar, chlorides and carbon dioxide, was at all times normal.

September 7 the sulfanilamide was reduced to 30 grains (2 Gm) daily, 5 grains (3.3 Gm) being given every four hours. September 14, administration of the drug was stopped. The mastoid wound healed normally. The patient was discharged September 18. She has been seen repeatedly since then and no residual symptoms have been found.

#### DESCRIPTION OF STREPTOCOCCUS

An obligate anaerobic beta hemolytic streptococcus was isolated on a blood agar plate by the gaseous displacement and palladinized asbestos technique of Weiss and Spaulding.<sup>2</sup> The colony was slightly granular, grayish white and opaque, with an entire border approximately 1 mm in diameter and surrounded by a zone of hemolysis 3 mm in diameter. This strain occurred in chains of from eight to twelve cocci when grown in brain broth mediums under anaerobic conditions. It required strict anaerobic conditions for growth. It has failed repeatedly to grow aerobically on blood agar plates or in unheated brain broth tubes after repeated transplants on anaerobic blood agar slants.

#### SUMMARY

1 A patient with meningitis of otitic origin caused by an anaerobic beta hemolytic streptococcus recovered.

2 Oral sulfanilamide therapy was relied on exclusively except for the first two days of the disease, when prontosil was given intramuscularly.

3 Following the temporary cessation of sulfanilamide therapy August 31 there was an aggravation of symptoms and the results of laboratory examinations were more pronounced.

4 It appears that patients with anaerobic beta hemolytic streptococcus meningitis may be favorably treated with sulfanilamide.

5 Anaerobic culture procedures in routine hospital bacteriologic studies are important.

#### VAGINITIS AND VULVITIS ASSOCIATED WITH AN EXCESS OF ESTROGEN IN THE BLOOD

EVAN SHUTE, M.B., F.R.C.S.C., LONDON, ONT.

The vulvovaginitis that develops in many women during and after the menopause, whether it is natural or induced, has been ascribed for years to cessation of the ovarian function. Clinically it is associated with an atrophy and depilation of the vulvar and perianal skin and a shiny, atrophic and smoothed appearance of the vaginal mucosa. The latter usually assumes a raw, scarlet color. At any time after these gross changes commence, the patient may complain of intense local pruritus, or burning and tingling, or vague and scarcely describable forms of paresthesia. The usual local applications fail to give relief for more than a short time.

One of the most important of recent therapeutic advances has been the use of estrogenic substances, either given by means of intramuscular injection or applied locally as suppositories, to relieve this distressing condition.<sup>1</sup> This is assumed to be a logical and obvious example of substitution therapy. However, any practicing gynecologist is aware that a very definite proportion of these cases, whose gross appearance in no way distinguishes them from cases that react satisfactorily, are not relieved by such estrogen therapy. Indeed they may actually be made worse by it. Much less attention has been paid to these cases than they merit.

Some light is cast on this problem by the recent reports of Frank and his collaborators,<sup>2</sup> who showed that all twelve surgical castrates tested excreted appreciable amounts of estrogen in the urine. In only two of the five cases of physiologic menopause that they studied was the excretion of estrogenic substance nil, one of these two showed estrogen in the blood. In a series of twenty-four surgical castrates, eleven roentgenologic castrates and ten natural postmenopausal cases, Salmon and Frank<sup>3</sup> found that in only 40 per cent of the forty-five women were the vaginal smears uniformly negative for estrogen. In 30 per cent estrogen was present occasionally, and in the remaining 30 per cent estrogen smears were always to be found. Novak and Yui<sup>4</sup> reported that of 804 women in whom curettage was done from one to twenty-four years after their last menses, forty showed endometrial hyperplasia, presumably of estrogenic origin. A review of the other evidence pointing in the same general direction has been given elsewhere<sup>5</sup> and need not be repeated here.

At first sight it would seem paradoxical that estrogenic activity should still be apparent in the female organism after castration or the climacteric. However, there is so much evidence for this conclusion that it is inescapable. The recent reports of estrogenic activity in the anterior pituitary body<sup>6</sup> and in the adrenal cortex<sup>7</sup> may serve to explain the source of at least some portion of this estrogenic material.

Suspecting that these women with a vaginitis which estrogen therapy did not relieve, and even occasionally aggravated, might be women who already displayed a definite or even excessive estrogenic activity, I began testing their blood serums for the presence of an estrogen cycle by the method which I have evolved.<sup>8</sup> I found that these women had either a constant

From the Department of Obstetrics and Gynecology, University of Western Ontario Medical School.

Dr. J. H. Geddes gave the author permission to describe case 1 and Dr. A. G. Calder his permission to describe case 3.

1 Kaufmann C. Clinical Uses of the Female Sex Hormone. *J. Obst. & Gynaec. Brit. Emp.* 44: 310 (April) 1937.

2 Frank R. T., Goldberger M. A. and Salmon U. J. Oestrogenic Substances in the Blood and Urine After Castration and the Menopause. *Proc. Soc. Exper. Biol. & Med.* 33: 615 (Jan.) 1936.

3 Salmon U. J. and Frank R. T. Hormonal Factors Affecting Vaginal Smears in Castrates and After the Menopause. *Proc. Soc. Exper. Biol. & Med.* 33: 612 (Jan.) 1936.

4 Novak, Emil and Yui Enmei. Relation of Endometrial Hyperplasia and Adenocarcinoma of the Uterus. *Am. J. Obst. & Gynec.* 32: 674 (Oct.) 1936.

5 Shute E. V. Notes on the Menopause. *Canad. M. A. J.* 37: 350 (Oct.) 1937.

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<sup>2</sup> Weiss J. E. and Spaulding E. H. *J. Lab. & Clin. Med.* 22: 726 (April) 1937.

excess of blood estrogen or a true estrogen cycle, two types of which Fluhmann<sup>9</sup> has described. It seemed rational in such cases to attempt therapy with substances antagonistic to estrogen, such as thyroid extract,<sup>10</sup> small doses of preparations of gonadotropic substances,<sup>11</sup> or, best of all, wheat germ oil.<sup>12</sup>

The number of cases of estrogenic vulvovaginitis which have been seen has been small, but their response to therapy has been striking. As this clinical entity has not as yet been described, so far as I know, the clinical records are given in some detail. Case 4 has been reported previously<sup>13</sup> and so will not be repeated in extenso.

As all these patients were seen recently in my private practice, I suspect that this type of vulvovaginitis is not uncommon. Unfortunately, no biopsy studies before or after therapy could be attempted, although they would be of unusual interest.

**CASE 1**—Mrs. J. S. T., aged 73, seen June 3, 1937, stated that for the past month she had experienced a severe burning and itching of the vulva. She said that this was aggravated by urination and that it sometimes awakened her at night. Moreover, at times she had the sensation of prolapse. The symptoms extended to the anus but were less intense there. She had been unable to sit on a hard chair of late. There was no pruritus elsewhere nor were there other complaints.

The menopause had been uneventful and occurred at the age of 53. Since then there had not been any bleeding, leukorrhea or nervous symptoms. In 1926 a plastic operation for second degree uterine prolapse had been done. There had been three children, the oldest was born when the patient herself had weighed 99 pounds (45 Kg.) and was said to have weighed 14½ pounds (6.6 Kg.).

Examination revealed nothing of note except in the vulvar region. The labia majora and minora were thickened, pallid, depilated and parchment-like in appearance and consistency. The perianal skin was red and desquamated. The vaginal mucosa was raw, reddened and so tender that it would scarcely permit the intrusion of a tiny speculum.

A blood test by my technique revealed an excess of estrogenic substance. Accordingly, she was given bulk cold pressed wheat germ oil according to my routine,<sup>14</sup> that is, 12 drachms (45 cc.) on the first day to insure neutralization of the excess of estrogenic substance in the circulation, followed by 1 drachm (3.75 cc.) each day.

There was prompt and decided relief, but some of the symptoms persisted. The physical changes were striking. The labia became soft and pliable and the raw vaginal mucosa assumed a much more normal appearance but there was no change in the desquamation of the perineal body and perianal area, which had left the sensitive dermis exposed. The patient observed that there seemed to be a definite exacerbation of her distress every two weeks lasting about three days.

The dose of oil was increased to 4 drachms (15 cc.) daily. On this she improved temporarily and was quite free of distress when seen July 2. However, July 8 the distress recurred with great severity. The anal region was especially tender. Accordingly the dose of oil was increased to 4 drachms three times each day but this proved ineffectual. Therefore 4 drachm doses four times a day were tried July 17, and after five days she was completely free from symptoms for the first time. The mucosa of the anus and introitus vaginal was violaceous, of normal consistency and no longer hypersensitive, and since that time this dose has kept her free from symptoms and signs of a recurrence of the vulvovaginitis.

**CASE 2**—Mrs. F. G., aged 53 had been under observation occasionally since June 1934, at which time there had been irregular menses and considerable psychic depression. Nothing of importance was found but a secondary anemia, occasional cardiac extrasystoles and a fibroid uterus of small size requiring no intervention. The basal metabolic rate was -4 per cent.

May 4, 1937 she complained of a troublesome leukorrhea which necessitated wearing a pad and vulvar pruritus. There

was no dysuria. There was a severe paresis of the left upper extremity with some accompanying paresthesia but no hyperalgesia. The mental depression had disappeared but hot flushes and severe night sweats persisted. The hemoglobin was 82 per cent (Sahli).

On examination the vaginal mucosa was tender, raw and red and was bathed with a heavy white discharge, which did not show gonococci or trichomonads. Externally there was some redness from irritation but nothing else of note. The blood showed an excess of estrogenic substance.

She was given bulk cold pressed wheat germ oil as in the preceding case, in the hope that its content of vitamin B<sub>1</sub> would clear up the neuritis of the left arm and that its content of vitamin E would control the estrogenic excess in the body. To give her more energy and assist the latter action of the oil, she was put on thyroid extract, 1 grain (0.06 Gm.) daily.

May 15 no change in the extremity could be detected but the vagina seemed much less sore and also the hot flushes and night sweats were milder. Grossly the vaginal mucosa appeared immensely improved, although it was still bright red and slightly tender. The oil dosage was increased to 4 drachms daily. In addition a commercial preparation of synthetic B<sub>1</sub> was given.

By the 25th, the vaginal mucosa was normal and the discharge minimal. The arm was unclenched. By June 5 the paresis, theses in the arm had gone but there was no change in the pruritus. The vagina had remained normal and symptom free. The B<sub>1</sub> dosage was increased from 50 units three times a day to 500 units three times a day. The arm soon began to show great improvement and was almost normal in mobility and strength by July 1. It has been normal since August 1. The vaginal condition has also remained normal.

**CASE 3**—Mrs. R. M., aged 26, when seen Dec. 16, 1936, had had vaginal irritation and urinary distress for a month. There had been a leukorrhea for the preceding ten months, and this had been treated with a proprietary preparation containing acetarsone (Devegan tablets) on the assumption that it was due to Trichomonas. No trichomonads were found but anti-trichomonas therapy was continued. The cystitis had subsided temporarily and seemed to require no treatment at the moment. There had been a severe menorrhagia since the birth of her baby one year previously, and considerable premenstrual dysmenorrhea had accompanied this.

The cystitis recurred in January 1937 and responded well to methenamine therapy. There was a high blood estrogen (January 2, just after the conclusion of menstruation (when it should be low), and the vaginitis had persisted in a subacute form in spite of the antitrichomonas treatment. Accordingly, a trial of cold pressed wheat germ oil was made in the dosage previously described. At once the vaginitis improved. By February 5 she remarked that she felt well for the first time in many months. The menorrhagia and dysmenorrhea had also disappeared promptly and thoroughly. The vagina looked normal. She stopped the wheat germ oil therapy.

The vaginitis recurred February 11 and she began taking the oil again. On the 16th there was no vaginitis but some cystitis, which again responded well to methenamine. The March period was normal and painless again. The oil was stopped. By March 5 she had gained 4½ pounds (2 Kg.) and had lost the nervous and harassed appearance which had characterized her since her first visits.

By April 6 there had been a mild recurrence of the vaginitis and leukorrhea. Accordingly she was advised to take the wheat germ oil in the premenstrual week each month. On that regimen she has remained free from vaginitis, menorrhagia and dysmenorrhea since.

**CASE 4**—Mrs. I., a widow, aged 60, first seen March 23, 1936, had felt well until May 1934 when uterine dysuria and some leukorrhea had developed. The menses had gradually stopped at the age of 54 and the menopause had been accompanied by menorrhagia and mental depression.

When first seen she had a profuse serous leukorrhea and reddening of the labia. The vaginitis was extreme and scarcely permitted the intrusion of a speculum. The mental state accompanying the intolerable burning pruritus was pitiable. Before the blood was tested for its estrogen content she was given 1,000 rat units of an estrogen preparation hypodermically. The

<sup>9</sup> Fluhmann, C. F. Oestrogenic Substance in the Blood of Women. *J. Obst. & Gynec.* 72: 612 (Oct.) 1936.

<sup>10</sup> Van Horn, W. M. The Peltion of the Thyroid to the Hypophysis and Ovary. *Endocrinology* 17: 152 (March-April) 1933.

<sup>11</sup> Reynold, S. R. M. A Predisposing Factor to the Normal Onset of Labor: the Probable Role of Estrin. *Am. J. Obst. & Gynec.* 29: 439 (May) 1935.

<sup>12</sup> Shute, E. V. Relation of Deficiency of Vitamin B<sub>1</sub> to the Anticlutic Factor Found in the Serum of Abortive Women. *J. Obst. & Gynec. Brit. Emp.* 42: 74 (Feb.) 1935.



appeared to aggravate her distress immensely. She became more nervous, had hot flushes and felt too hot to sleep at night, and the vaginal mucosa looked even more acutely inflamed. By April 6 a right-sided inguinal adenitis had developed and, since the estrogenic substance of the blood had been found elevated, she was given wheat germ oil (ether extracted) by the usual routine.

By April 10 there was great improvement. By the 17th she said that she felt "better than in months." The leukorrhea had ceased. The inguinal adenitis had almost disappeared. The vaginal mucosa was still slightly reddened but seemed nearly normal. The vulva appeared normal. By May 19 she had begun to look placid for the first time since she had been seen, and she did not have vaginitis or adenitis. However, she seemed to be one of the cases of idiosyncrasy to wheat germ oil that we have found. A widespread urticaria developed every time she returned to the oil after being off oil therapy until the urticaria had cleared up. The patient later resorted to medical care elsewhere.

## SUMMARY

1 Women may continue to show a high content of estrogenic substance in the blood even many years after the menopause.

2 A type of vulvovaginitis is correlated with this fact, it responds to treatment with wheat germ oil.

280 Queens Avenue

FEVER OF UNDETERMINED ORIGIN IN A PATIENT  
WITH TRAUMATIC BRACHIAL ANEURYSM  
CURED BY EXCISION

E V KANDEL, M.D., CHICAGO

A recent case of traumatic brachial aneurysm presented several interesting features and seems worthy of reporting.

L. M., a white American laborer, aged 24, in the cold and freezing rooms of a Chicago packing company was referred to the Hematology Clinic of the University of Chicago, Oct. 15, 1935, because "abnormal cells" had been seen in blood films. He complained of chills, fever, nausea and vomiting during the last month and a half, a general sick feeling for the last four years, and pain in the right arm for four years. In 1925 he had been shot in the right arm, the 0.22 bullet entering about 4 cm above the flexor crease on the lateral surface of the biceps brachii tendon and ranging upward. It was removed from the arm two hours later and the wound healed, the patient thought, without any infection. The sole resulting disability was limitation of extension of the forearm. In 1931 the right arm had been violently extended, and the patient experienced a severe tearing pain in the medial region of the elbow. The arm was quite painful, keeping him from work for ten days. A roentgenogram at that time was said to show a "soft tissue tumor," and surgical removal was advised but refused. Since then moderate pain persisted, the patient missing about one day's work a month because of it. During the two or three years prior to our examination the patient would frequently come home from work feeling very weak, flushed and feverish, although his temperature was never determined. Intermittent "rheumatic" pains in the knees and ankles occurred at this time but were attributed to the cold environment in which he worked. In 1934 the patient began to have attacks of numbness in the thumb and first two digits of the right hand. These would last a few days and came at infrequent intervals and were always associated with an increase of the pain in the region of the tumor on the right arm. In June 1935 the numbness had become so troublesome that he consulted the company surgeon, who recommended removal of the tumor and freeing of the median nerve. This was done June 4 and at operation the egg-size tumor was found to consist of a fibrous tissue mass adherent to an aneurysm of the brachial artery. The tumor was removed but no effort was made to dispose of the aneurysm. The operative wound healed by first intention. From then until his admission to this clinic pain in the wound prevented the patient from doing

any but the lightest work. One night at the end of August the patient awoke at 3 a. m. with a severe chill and pain in the knees and ankles. The chills recurred at frequent intervals, and two days later he was found to have a temperature of 104 F. Subsequently nausea, vomiting and a moderate diarrhea developed, which lasted for three days, accompanied by frequent elevation of temperature. For seven days he was studied at the Cook County Hospital and no cause for the fever was ascertained. After being discharged from there he improved somewhat and returned to work, but within two weeks the chills recurred. Beginning September 30 he had several chills a day, accompanied by drenching sweats and a fever as high as 103 F. This episode was just subsiding when he came to the clinic.

Other details of his past history included typhoid when he was 3 years old and gonorrhea, uncomplicated, when he was 21. He had been married for a year and a half. Inquiry disclosed only palpitations and infrequent epistaxis in the last six months. The family history was irrelevant. None of his associates at work and no member of his family suffered from any condition similar to his.

On examination the patient was pale and rather pudgy and looked sick. His temperature was 98 F and pulse 100 per minute. The heart was normal in size and shape, no murmurs were detected. The lungs were normal on physical examination. The blood pressure was 114/88 in the left arm, 88/? in the right arm and 124/80 in the legs. The abdomen and genitalia were normal and the spleen and liver not palpable. On the medial surface of the right arm was a healed scar 8 cm long extending upward from the elbow crease. At the lower end of the scar was a visible, walnut-size tumor that pulsed synchronously with the radial pulse. It was firmly attached to the surrounding tissues, and a systolic thrill could be felt and a soft rough systolic bruit heard over it. One received the impression of local heat over the tumor. The arm below the aneurysm was definitely warmer than the opposite one. It was noticed that the right hand throbbed slightly in time with the heart beat. Capillary pulsation was seen in the nails of the right fingers. There was hypesthesia to pin prick and cotton wool over the skin representation of the median nerve, but there was no motor palsy. Examination of the blood at that time showed hemoglobin 15.2 Gm, erythrocytes 4,210,000, leukocytes 13,500. The differential count was neutrophils 70 per cent, lymphocytes 22 per cent, monocytes 4 per cent, eosinophils 4 per cent, no abnormal red or white cells were seen. The sedimentation rate was 55 mm per hour. The urinalysis was normal in every respect.

October 26, eleven days later, he was hospitalized. His general condition and physical examination were unchanged. The results of further studies in the hospital were as follows: x-ray examination of the chest was negative, five blood cultures were negative, sheep cell agglutination, none, melittin group agglutination, none, typhoid-paratyphoid dysentery group agglutination, none, tularensis group agglutination, none, skin tests and agglutination for Trichina, negative, stool cultures and examination for parasites, negative, serologic reaction, negative, urine, normal on all occasions.

It was suggested that the aneurysm might, in reality, be an infected arteriovenous fistula, and the clinical symptoms the result of a mild septicemia of which the aneurysm was the focus. The surgical consultant did not think there was evidence for an arteriovenous fistula, because compression of it did not slow the pulse or raise the systemic blood pressure, although it obliterated the radial pulse. Because of the pain and neural involvement excision was recommended. The operation was performed by Dr. F. E. Kredel, November 8, under ethylene ether anesthesia. The old scar was excised, an aneurysm about 8 cm long and 5 cm broad, extensively adherent to the surrounding structures and the median nerve posteriorly was exposed. There were no extensive venous communications. The aneurysm was dissected off the median nerve and excised after ligation of the dilated entering portion of the brachial artery. During separation from the nerve it was slightly injured and immediately repaired with blood vessel silk in the perineurium. The wound was closed without drainage. The postoperative course was uneventful, the wound

healing by first intention. The temperature, which had reached 100.2 F daily, became and stayed normal. The sensory loss was moderate and unchanged on discharge from the hospital November 18. For the first five days after the operation the right hand was moderately swollen and was definitely cooler than the left, but by the day of discharge this disparity had completely disappeared. The patient's course since leaving the hospital has been excellent, full and painless use of the right hand and arm were present April 13, 1936. In December 1936 the sensory loss had completely disappeared and there was a definite but mild hyperesthesia of the volar surface of the second and third right digits. When queried by telephone in September 1937 the patient stated that he was perfectly normal and had experienced no chills, fever, malaise or rheumatic pain since the operation. He has been working at his old job in the refrigerated rooms and considers himself cured as a result of the surgical intervention.

Immediately after the aneurysm was removed it was cut open, and a large portion of the wall and about one half of the enclosed mural thrombus were placed in a flask of plain broth for culture. The only organism recovered was a diphtheroid bacillus in pure culture. The cultural characteristics of the organism were not recorded and no further work on its identity was done.

When examined in detail, the remainder of the aneurysm was found to have three openings into its inner aspect, of which two were obviously the entrance and exit of the brachial artery. These were about 1 cm apart and in the wall intervening were calcific plaques. At both sides of these openings were cystic dilatations almost completely filled with adherent mural thrombi with vegetative surfaces. In the wall of one of the outpouchings was the third opening, about 2 mm in diameter and extending to the outside. No definite venous remnant was identified grossly, and no block of this region was fixed for section.

Microscopically, the organized thrombi contained many calcified areas. They were surrounded by a loose connective tissue wall, which blended peripherally with the artery wall, which appeared normal in every respect. In this loose connective tissue was a moderate, irregular round cell infiltration with plasma cells and eosinophils in small numbers. In no section was there any endothelium detected over the surface of the thrombi.

#### COMMENT

The justification for reporting this case is its similarity to that of Hamman and Rienhoff,<sup>1</sup> which we had in mind when the chills, fever and other symptoms in our case were related to the traumatic aneurysm of the arm. Their patient, however, was much sicker, had a definitely arteriovenous aneurysm, had a *Streptococcus viridans* bacteremia and had vegetations in the aneurysm from which a similar organism was cultured. Their patient, too, was completely cured by excision of the aneurysm. In our case the clinical disagreement with the diagnosis of infected arteriovenous aneurysm was unfortunately not adequately settled at operation, for the surgeon was not certain that the veins ligated in the course of the operation emerged from the aneurysm; later, cultures were taken of almost half of the specimen and it was subsequently destroyed. The microscopic examination disclosed remnants of chronic inflammation, but the most charitable examiners of the specimen were loath to agree that this was adequate to account for the chills and fever and general disability from which the patient sought relief. However, the greater portion of thrombi, especially the looser ones, were put into the culture flask with the portion of the wall. The bacteriologic evidence likewise is not too helpful, for a diphtheroid bacillus, although rarely encountered as a contaminant in the surgical bacteriologic laboratory, may enter cultures in that manner. Subsequent tests of the patient's blood against a diphtheroid bacillus for antibodies were not made.

On the other hand, the operation seems to have effected a clinical cure, for now, almost two years later, the patient

has no more of the symptoms that he presented when he came to the clinic. He considers himself well as a result of the operation. Further, the complete absence of any vestige of an endothelial covering of any of the thrombi examined microscopically would not be contrary to a belief that they were infected in a low grade manner. It should be noted that subsequent to an injury to the tumor, four years before our examination the aneurysm had been painful, and the patient had suffered mildly from fatigue, feverishness and "rheumatic" pains. The acute phase of his illness, moreover, followed surgical exploration of the region of the aneurysm. Finally, diphtheroid bacilli and diphtheroid-like streptococci are capable of producing a chronic bacteremia. Although I feel very strongly that a chronic infection in an arteriovenous fistula with undetected bacteremia is the correct interpretation of the febrile illness described, it is not improbable that there was solely an endarteritis of low virulence in an aneurysm.

None of the standard surgical textbooks describe the occurrence of infected vegetations in traumatic aneurysm, and the case of Hamman and Rienhoff seems to be the sole example in the available literature. Because of the possibilities of infection and the inevitable stasis and mural thrombosis associated with traumatic aneurysms, it seems odd that more cases have not been noted.

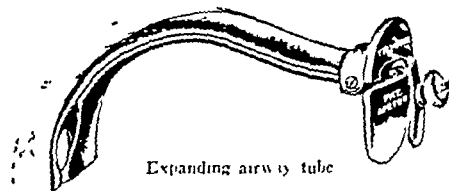
#### CONCLUSION

In a patient suffering an intermittent fever of obscure etiology the only abnormality discovered after an extensive study was a painful, ten year old traumatic aneurysm of the right brachial artery. Excision of this was followed by a complete disappearance of the patient's complaints. It is believed, but not proved, that a diphtheroid bacillus, cultivated from broth in which a portion of aneurysm and its contained thrombi were cultured, was the etiologic agent of the "fever of unknown origin."

#### EXPANDING AIRWAY TUBE

JAMES T. GWATHMEY, M.D., NEW YORK

The object of airway tubes, Magill catheters and catheterization of the trachea is to overcome obstructions in the airway and establish natural breathing. Only experts can introduce a catheter either nasally or directly, but an airway tube can be used in an emergency by any one. Tubes are now an indispensable part of every anesthetist's kit, but the ordinary airway does not always work, as, in addition, the jaw may have to be held forward in order to give free breathing. The expanding airway tube allows natural breathing, that is nasal as well as oral. After insertion, the blades are opened as one would manipulate a vaginal speculum, by turning a small screw,



the largest expansion being near the entrance of the trachea thus making possible natural breathing (nasal and oral). Oxygen can now be easily introduced if the air is insufficient. Care must be taken not to remove the airway while it is expanded. The blades must always be collapsed before removing, to avoid traumatization. In addition to its use in anesthesia, it may possibly be used in diphtheria or other diseases in gas poisoning in drowning or whenever breathing is difficult.

Removal of saliva, blood or other foreign substances is made easier with the airway in place.

133 East Fifty-Eighth Street

2. Ferguson, J. A., Murdock, T. P., and Welch, Henry. Significant of Streptococci That Resemble Diphtheroids Recovered from Blood Cultures in Subacute Bacterial Endocarditis. *J. Lab. & Clin. Med.* 10: 1331 (Sep.) 1934. Welch, Henry, Murdock, T. P., and Ferguson, J. A. Subacute Bacterial Endocarditis Produced in Rabbits with Streptococci That Resembled Diphtheroids. *Am. J. Path.* 12: 64 (Sept.) 1936.

1. Hamman, Louis, and Rienhoff, W. F. Jr. Subacute Streptococcus Viridans Sepsis Cured by Excision of an Arteriovenous Aneurysm of the External Iliac Artery. *Bull. Johns Hopkins Hosp.* 57: 219-234 (Oct.) 1916.

## Special Article

### THE PATHOLOGY OF BERIBERI

C B VEDDER M D  
Colonel Medical Corps U S Army Retired  
WASHINGTON, D C

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed*

Beriberi is a disease resulting from faulty metabolism and is directly caused by deficiency of the antineuritic vitamin B<sub>1</sub>, and possibly other deficiencies in the diet. Among Orientals, this deficiency is usually produced by the too exclusive use of decorticated or polished rice, but it may equally be caused by the too exclusive use of white wheat flour and other carbohydrate staples. Clinically, beriberi is characterized by degenerative changes in the nervous system including a multiple peripheral neuritis, which may exist alone but is often combined with generalized edema and serous effusions, and by a tendency to the development of cardiac hypertrophy, which frequently results in cardiac failure and sudden death. In this definition vitamin B<sub>1</sub>, as distinguished from other fractions of the vitamin B complex, is the compound isolated and synthesized by R R Williams, a compound of pyrimidine and thiazole which has been designated by Williams as thiamin.

As is evident from the foregoing definition, the pathology of beriberi may be discussed under three heads: cardiac pathology, degenerative changes in the nervous system, and anasarca. While much has been learned concerning the etiology of beriberi from animal experimentation, one should distinguish between the pathology of human beriberi and that of birds and animals.

#### THE PATHOLOGY OF HUMAN BERIBERI

Knowledge of human pathology is more limited than it should be after so many years of study, but it is significant. Death does not appear to be caused by neuritis, however extensive it may be, but by cardiac hypertrophy followed by sudden dilatation and cardiac failure. Accordingly, on postmortem examination the heart is found markedly dilated and hypertrophied especially on the right side, the chambers being filled with blood not very firmly clotted. The valves are normal, nor is there any obvious degeneration. Ellis<sup>1</sup> in 1898 in 125 necropsies of beriberi found the average weight of the heart to be 13.37 ounces (379 Gm), the right side in nearly every case being much enlarged. During the same period 204 hearts from patients dying of other diseases averaged just under 9 ounces (255 Gm). McLaughlin and Andrews<sup>2</sup> described finding the same conditions in infantile beriberi. "Probably the most striking and constant change is found in the right heart. Its musculature is coarse and firm and forms much the larger part of the organ, even in the contour of the apex. Its trabeculae and papillary muscles are prominent,

while its cavity is enlarged. The wall of the right ventricle may measure from 5-7 millimeters in thickness while the left measures only 3-5 millimeters." The weight of the heart in Andrews' cases of infantile beriberi averaged 34.1 Gm with a maximum of 54 Gm, while in death from other diseases the average heart weight was 20 Gm, with a maximum of 32 Gm. Later figures<sup>3</sup> are consistent. The average weight among Japanese beriberi patients has been given as 368 Gm, while the maximum of normal hearts is 300 Gm. The enlargement is most pronounced in the right chambers, and the left side of the heart may be very small. The right auricle is huge, with a paper thin wall through which the dark blood within may be seen.

As the result of the back pressure caused by the failure of the right side of the heart, pulmonary edema occurs in at least half of the cases, and chronic passive congestion of the liver, spleen, kidneys and intestine is constant. Punctate hemorrhages are often found subpleurally as well as in the stomach and duodenum, while the vessels in the walls of the stomach and intestine are dilated and hyperemic. The liver often has the typical nutmeg character, the spleen is perceptibly increased and hyperemic, and the kidneys are cyanotic. Microscopically, some degree of cloudy swelling or fatty degeneration may be found in the liver and kidneys in some cases. Fragmentation of the heart muscle has been described, but these changes are now generally believed to be merely post mortem. One of the obvious difficulties has been the rapid change occurring in the tropics, where most of these cases have been studied.

The cause of the hypertrophy and dilatation of the right side of the heart is not known. Formerly attributed to degeneration of the pneumogastric nerves, it is only necessary to state that this explanation does not account for the fact that the right side is usually solely affected and there is apparently no correlation between the intensity of degeneration of these nerves and the cardiac disturbance. Wenckebach<sup>4</sup> explained the combination of cardiac hypertrophy and weakness by assuming that the hypertrophy was caused neither by an increased number of muscular fibers nor by a true increase in their size, but that this increase in size was caused by the imbibition of fluid. He pointed out that the electrocardiogram was normal and that when vitamin B extracts were administered the hypertrophy melted away "like ice in the sun." It is also true that cardiac hypertrophy is much more frequent in the "wet" than in the "dry" forms of beriberi. Unfortunately this explanation does not account for the peculiar selection of the right side of the heart for this action, nor has it been proved, which should be a simple matter. If the hypertrophy is caused simply by the imbibition of fluid by the muscle fibers, this could be shown by comparing the weight of this dried heart muscle with the dried weight of normal hearts. This has not been done for human cases. But Newcomb<sup>5</sup> examined pigeons' hearts. Of ninety-six pigeons fed on deficient diets, eighty-four developed polyncuritis columbarum, eight developed beriberi columbarum, which by definition included edema and enlarged hearts in addition to polyncuritis, and four died from other

<sup>3</sup> Eddy W H and Dalldorf Gilbert. The Avitaminoses. Baltimore: Williams & Wilkins Company, 1937, p. 100.

<sup>4</sup> Wenckebach K F. Heart and Circulation in a Tropical Avitaminosis (Beriberi). *Lancet* 2: 265 (Aug 11) 1928. Alsmeyer and Wenckebach. Herz und Kreislauf bei der Beriberi Krankheit. Berlin: Urban & Schwarzenberg, 1929.

<sup>5</sup> Newcomb C. Water Content of Heart Muscle in Beriberi Columbarum. *Indian J. Med. Res.* 17: 721 (Jan) 1930.

From the Department of Experimental Medicine, George Washington University Medical School.

<sup>1</sup> Ellis W C. A Contribution to the Pathology of Beriberi. *Lancet* 2: 958, 1898.

<sup>2</sup> McLaughlin and Andrews. Studies on Infantile Mortality. *Philippine J. Sc.* 5: 156, 1910.

causes. The heart muscle of all these birds was dried and weighed. Newcomb concluded that "The beriberi pigeons do not show a greater water content in their heart muscle than other pigeons fed on these diets. If a large heart in these birds is to be explained by water retention, they should, and quite definitely do not."

Until similar observations are made on the enlarged hearts in cases in man,<sup>5a</sup> the question cannot be regarded as settled, but the fact is that at present we are still at a loss to account for the concomitant right sided hypertrophy and weakness in beriberi.

#### NERVE DEGENERATION

*The Spinal Cord*—The changes in the cord are not usually apparent grossly, but Bentley<sup>6</sup> reported nineteen necropsies and found the brain and its membranes congested and the spinal cord congested and softened. 'The lesions of the cord were so gross as not to require the use of the microscope to see them, for in some only a few hours after death, the cord was soft and diffuent with hemorrhages marked congestion and extensive edema quite sufficient in themselves to cause all the symptoms. My observations go to prove that it is a cord lesion which involves both sensory and motor functions of central origin, a subacute inflammation of the spinal cord and its membranes.' While most observers have not found such gross changes or have attributed them to postmortem degeneration, there can be no doubt as to the microscopic changes, which have been reported by all observers. Degeneration of the medullary sheath has been demonstrated in scattered fibers in all tracts of the cord, but especially in the posterior columns as well as in both anterior and posterior nerve roots. In some cases the axis cylinder is fragmented. Degeneration of the medullary sheath is best demonstrated by the Marchi method, of the cells by Nissl or Giemsa stains. The axis cylinder is readily seen when degeneration of the medullary sheath is extensive but may be brought out more clearly by special stains such as those of Golgi or Mallory. Wright<sup>7</sup> found changes in the posterior spinal ganglion and anterior horn cells, and in the nuclei of the medulla in cases in which the fibers originating from these cells were atrophied. That is, atrophy or loss of function in the axon leads to or is concomitant with disturbances in its trophic cell. The changes found in these cells depend in intensity on the length of time the polyneuritis has existed and include swollen and dislocated nuclei and loss of the Nissl bodies, which break down into a powdery mass. In more advanced degeneration this powdery mass almost disappears and there is vacuolation of the cell with rupture of its membrane and fragmentation of its processes. Similar changes have been found in the ganglion cells of the medulla and pons. These degenerative changes in most cases are not to be regarded as complete, which would mean the death of the cell from which there could be no recovery, but they do indicate a very complete exhaustion of the affected cells.

*The Peripheral Nerves*—Since the legs are first affected in beriberi, degeneration is most marked in the sciatic nerves and its branches, but some degree of degeneration may be found in any peripheral nerve. Degeneration of the myelin sheath is constant and affects the majority of the fibers, the myelin being broken up into balls or beads and eventually disappearing. When this occurs, the axis cylinders may show a coiled appearance and in certain cases are fragmented or atrophied. The more chronic and advanced the case, the more nerve cylinders are affected, but usually the majority appear normal even when the medullary sheath shows advanced degeneration. At the same time that such advanced changes are found in the nerves supplying the legs, the brachial nerves may show only a diffuse blackening of the myelin sheath with the Marchi stain. Similar degenerative changes have been found in the cranial nerves, particularly the phrenics and the vagi. It is especially to be noted that degeneration of the sympathetic system has been demonstrated, as in branches of the cardiac plexus, the splanchnic nerves and branches of the solar and renal plexuses.

The muscles supplied, particularly of the leg and thigh, are markedly atrophied, with loss of cross striation and shrinkage of the sarcoplasm often combined with cloudy swelling or fatty degeneration. These changes are not characteristic of beriberi but may be found in the muscles in any variety of polyneuritis. In very advanced cases, the muscles of the arms or even of the trunk are similarly atrophied, and such muscles are exceedingly tender to the touch, causing the patient to flinch from the gentlest examination.

#### EDEMA AND SEROUS EFFUSIONS

Dry beriberi was described by Bontius in 1642 and edema and serous effusions were not described until 1808, and in 1812 Marshall described dry beriberi and wet beriberi as two separate diseases. In 1835 Malcolmson pointed out that cases commencing as wet beriberi became transformed into dry beriberi after a sudden diuresis, while edema often developed in dry cases. From this he concluded that dry and wet cases were but two types of the same disease. The proportion of wet cases will therefore vary in different outbreaks of the disease.

When edema occurs, it is noticed first in the legs and thighs, which often swell to such an extent as to make walking difficult. While often confined to these limbs it may become general, although the face is rarely affected. Edema of the lungs may be found in 50 per cent of the cases.

On making the postmortem incision in such cases, fluid blood exudes from the cut vessels, and serous fluid in the subcutaneous tissue is at once noticed. With regard to effusions, the pericardium is most frequently affected, followed by the pleura and the peritoneum. The effused fluid is clear and of a distinct greenish yellow.

In sixty-four cases in Java, pericardial fluid was found in sixty-two, hydrothorax in fourteen, and ascites in nine.

In 125 cases from the Malay States, hydrops of the pericardium was found in eighty-one, pulmonary edema in seventy-eight, hydrothorax in ten, and ascites in five. The amount of fluid in the pericardium varies from 50 to 500 cc. in hydrothorax from 50 to 2,000 cc. The amount of fluid in the peritoneum is seldom large enough to cause much distention.

5a Since this article was written Weiss and Wilkins have contributed an article (Annals of Internal Medicine 11: 104 [July] 1937) in which they state that in hearts of patients suffering from deficiency of the B complex especially vitamin B<sub>1</sub> they found hydropic degeneration of the muscle and conductive fibers and increase in the intercellular substance but unaltered water content.

6 Bentley, F. J. Beriberi: Its Etiology, Symptoms, Treatment and Pathology. Edinburgh, A. J. Pentland 1893.

7 Wright, H. Changes in the Neuronal Centers in Beriberic Neuritis. Brit. M. J. 1: 1610 1901. An Inquiry into the Etiology and Pathology of Beriberi. Studies from the Institute of Medical Research, Federated Malay States 1912.

PERCENTAGE OF WET CASES IN INFANTILE  
BERIBERI

Cases of dry beriberi in infants have been described but they are relatively uncommon, in fact, McLaughlin and Andrews,<sup>8</sup> studying 219 infants dying under 1 year of age, showed that 124 of them died of a condition which they designated as moist beriberi. In later necropsies Andrews<sup>8</sup> based his diagnosis on four points (1) cardiac hypertrophy and dilatation, (2) congestion of the viscera, (3) anasarca and (4) absence of any other condition to account for death. All the cases of infantile beriberi identified by postmortem examination were therefore wet beriberi.

The cause of this general anasarca is not known. The fluid has the appearance and characteristics of simple transudates and has been attributed to degeneration of the sympathetic system and to the back pressure from the functional impairment of the right side of the heart, and more recently Eppinger<sup>9</sup> has considered the fluid to be the product of serous inflammation. Not one of these explanations is satisfactory. It was early noted that the edema was often dissipated after a sudden diuresis. This was probably due to a sudden change in diet because the edema in cases of ship beriberi also cleared up miraculously as soon as the sailors reached land and ate shore food. Again, Chamberlain and Vedder<sup>10</sup> found that the edema of infantile beriberi was dissipated by diuresis in two or three days as the result of administration of an extract of rice polishings that were primarily extracted with 95 per cent alcohol. This extract contained no protein and did contain large amounts of vitamin B<sub>1</sub>. But this extract contained also many other nitrogenous bases. As the result of these considerations I incline toward the hypothesis that the edema is caused by the deficiency of some as yet unidentified food constituent, possibly some fraction of the B complex aside from B<sub>1</sub>, or some purine or other organic base.

## BERIBERI IN BIRDS AND ANIMALS

Are the degenerative changes in the nervous system found in birds and rats fed on B<sub>1</sub> deficient diets due to beriberi or to inanition? Eijkman, who first discovered polyneuritis gallinarum, and most subsequent observers have considered the disease analogous to beriberi in man, but in recent years there has been a strong tendency to ascribe most of these pathologic changes to inanition caused by the failure of birds or animals to eat. It is well recognized that B<sub>1</sub> deficient diets cause an early failure of appetite. As early as 1911 Chamberlain, Bloomberg and Kilbourne<sup>11</sup> found that fowls starved to death developed a degeneration of the peripheral nerves not readily distinguished from the degeneration found in polyneuritis gallinarum induced by an exclusive rice diet. Quite recently, Davison and Stone<sup>12</sup> starved rats and, finding pathologic evidences of polyneuritis, concluded that "the pathological changes in the nervous system in animals suffering from inanition are essentially the same as in those deprived of vitamin B<sub>1</sub> or of both vitamins B<sub>1</sub> and B<sub>2</sub>. If anything

the changes in the peripheral nerves in animals subjected to inanition are more marked."

Kon and Drummond<sup>13</sup> attempted to separate the effects of inanition from deficiency in vitamin B by feeding four groups of pigeons. The pigeons in lot 1 received an artificial ration deficient in B. The birds in lot 2 were forced to eat the same quantity of food eaten by the birds in lot 1 plus 1 Gm of yeast extract (marmite). The pigeons in lots 3 and 4 were forcibly fed with amounts of the deficient ration calculated to maintain weight. The pigeons in lot 4 received in addition 1 Gm of yeast extract. The authors attributed the nerve changes to inanition, chiefly because the birds in lots 1, 2 and 3 lost weight rapidly. But the birds in lot 4, supposed to receive an adequate diet, also lost weight, and all these birds in lots 1 and 3 fed on the deficient diet were deprived of the entire B complex instead of only B<sub>1</sub>.

It must be admitted that rats starved to death show definite degenerative changes in the nerves of the same general character as those found in polyneuritis. Nor are these degenerative changes eliminated when such starving animals are given adequate amounts of B<sub>1</sub>. The degenerative changes are as a rule quite slight and consist of occasional minute droplets taking the black stain and according to my belief are not as extensive as the changes found in polyneuritis caused by feeding diets deficient in B<sub>1</sub>.

Admitting that birds and rats fed adequate rations except for B<sub>1</sub> lose weight, and that starving rats given adequate amounts of B<sub>1</sub> show degenerative changes in their nerves, there is an excellent reason for not attributing these changes to inanition, for this is too simple an explanation, or rather, it is an explanation that explains nothing. The nerve changes occurring in polyneuritis gallinarum are precisely similar to those occurring in human beriberi, and human patients are often well nourished and do not lose weight. Actually, one of the reasons often urged against dietary deficiency as the cause of human beriberi has been the fact that many patients maintain their weight and appear well nourished. Further studies on the physiologic action of B<sub>1</sub> may elucidate these difficulties.

Birds fed diets deficient in B<sub>1</sub> ordinarily develop only polyneuritis comparable to dry beriberi in man. But McCarrison<sup>14</sup> succeeded in producing edema and enlarged hearts in a considerable number of pigeons, in addition to the polyneuritis, by feeding them on diets similar to those used by natives of India who develop beriberi. These diets included, in addition to rice, certain proportions of dal (a legume) and other anti-neuritic foods. McCarrison called such cases beriberi columbarum as distinguished from polyneuritis columbarum, the term applied to polyneuritis alone.

## POLYNEURITIS GALLINARUM OR COLUMBARUM

The nerve lesions in such birds have been described by Vedder and Clark.<sup>15</sup> In sciatic nerves stained by the Marchi method, practically every fiber shows some evidence of degeneration, the extent of which varies greatly in the fibers of the same nerve. Some fibers show only a localized slight blackening but the majority show more extensive change, frequent droplets of degenerating myelin. In from 10 to 15 per cent of the

13 Kon S K and Drummond J C. Physiological Action of Vitamin B. Study of Vitamin B Deficiency in Pigeons. *Biochem J* 21: 632 (1927).

14 McCarrison Robertt. Beriberi Columbarum. *India J Med Res* 10: March 1928.

15 Vedder E B and Clark E. A Study of Polyneuritis Gallinarum. *Philippine J Sc* 7: 423 (Oct.) 1912.

8 Andrew V L. Infantile Beriberi. *Philippine J Sc* 7: 67 (1912).  
9 Eppinger Hans. Die Seröse Entzündung. Vienna: Julius Springer 1913.

10 Chamberlain W P and Vedder E B. The Cure of Infantile Beriberi by the Administration of an Extract of Rice Polishings. *Bull Manila M Soc* 1: 26 (1912). Albert Jose. Studies on Infantile Beriberi Based on Five Hundred and Fourteen Cases. *Philippine J Sc* 45: 297 (June) 1931.

11 Chamberlain W P, Bloomberg H D and Kilbourne E D. A Study of the Influence of Rice Diet and of Inanition on the Production of Multiple Neuritis in Fowls. *Philippine J Sc* 6: 177 (1911).

12 Davison Charles and Stone Leo. Lesions of the Nervous System of the Rat in Vitamin B Deficiency. *Arch Path* 23: 207 (Feb.) 1937.

fibers, there is in addition a swelling of the nerve sheath at these points and a disintegration of the axis cylinder, which is fragmented

*The Stages of Myelin Degeneration*—The earliest stage consists of slight swelling of the medullary sheath and a tendency toward segmentation at the circumference. Then follows the stage in which the largest globules distending the nerve are seen. Next is a stage in which the globules are much smaller though quite black and which only partly fill the sheath of Schwann. Then follows a stage in which the shrunken neurilemma contains only a few scattered droplets of fat.

The condition does not commence in peripheral branches and extend to the cord but appears to be as intense near the cord as in peripheral branches. Similar changes are found in the vagi in all cases as well as in the ventral and dorsal nerve roots but were much more advanced in the ventral roots.

*The Spinal Cord* Degeneration was observed in the fiber tracts of all columns. Evidences of degenerated fibers were found in the thoracic region as well as in lower sections. The degenerative changes in the myelin sheath were the same as those described for the earlier changes in the nerves.

*The Brain* Similar observations in Marchi preparations were made on the fiber tracts of the medulla, pons, midbrain and internal capsule, and degenerated fibers were found in each one of these brain divisions comparable to those found in the cord.

*The Nerve Cells* Stained by the Nissl or Giemsa stains, changes are most marked in the cells of the lumbosacral region in both anterior and posterior horns of the cord. In these cells the stainable tigroid substance shows a marked tendency to break down into granular material diffused throughout the cell, or in later stages for the collection of this granular material at one side of the cell around the base of one of the processes. This granular appearance is suggestive of disintegration rather than solution of the tigroid substance. The cells of other parts of the gray matter of the cord do not show this change to such an extent, but they stain poorly and the cells have a pale appearance. In some instances the nuclei are dislocated or pale and poorly stained, suggesting degenerative change, but this was noted in very few cells. On the whole the cells appear to indicate exhaustion rather than degeneration, and such changes have been brought about by fatigue. It appears therefore that, along with degeneration of the peripheral nerves and in the fiber tracts of the cord and brain, there occur changes in the nerve cells of the anterior and posterior horns of the spinal cord which may or may not signify actual degeneration, which probably does not occur until near the death of the fowl. Complete degeneration obviously cannot occur so long as recovery is possible. But it is recognized that in extreme cases of polyneuritis gallinarum recovery will not occur even after adequate administration of soluble B<sub>1</sub>, and this may be due to actual degeneration of these nerve cells.

Comparing these changes with the changes in the nervous system already described as occurring in human beriberi the great similarity of the two conditions is emphasized.

McCarrison<sup>16</sup> has described hypertrophy of the adrenal glands in polyneuritis of birds induced by B<sub>1</sub> deficient diets and an increased output of epinephrine

Several observers have confirmed this enlargement of the adrenals in birds, but Kon and Drummond<sup>15</sup> found no difference in the amount of epinephrine secreted by polyneuritic pigeons as compared with normal birds. This enlargement of the adrenals appears to be confined to birds, for according to my limited experience the adrenal glands are not enlarged in rats on B<sub>1</sub> deficient diets and, so far as I am aware, enlarged adrenals have not been mentioned either in animal experiments or in cases of human beriberi.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE  
HOWARD A. CARTER, Secretary

### PHYSICAL THERAPY DEPARTMENTS IN HOSPITALS WITH FIFTY OR MORE BEDS

The increasing recognition of the value of physical therapy in conjunction with medicine and surgery has led to a growing demand for information on suitable plans for departments of physical therapy. The following outline of minimum requirements for such departments is suggested with this in view.

Each hospital has certain problems common to all as well as its own individual ones. In any given instance, the type of hospital, the types of cases treated, the number of nonpaying as compared to paying patients, and, most important of all, the attitude of the general staff toward physical therapy will determine the size of the department. If the staff members are not aware of the good results that may be obtained through the use of physical therapeutic measures, such as the important shortening of convalescent periods and the more complete restoration of function to injured joints, muscles, tendons and nerves, they will not refer cases to the department which may profit by these treatments but will use it as a dumping ground for patients with chronic disabilities.

Any therapeutic measure to be effective must be prescribed with a definite objective in view. Ill advised prescription of physical therapeutic agents by the director of the department will discourage both the patients and the referring physicians. Their consequent loss of confidence will be reflected in the general attitude toward the department. Since the success and growth of the department depend on satisfying these two parties, it is most essential that the staff be alive to the possibilities inherent in physical therapy so that its intelligent cooperation will be assured. Without this, the department will not become an integral part of the institution.

Once the cooperation of the staff has been secured, the next step in planning the department lies in considering the chief function for which the hospital was planned, since this will determine the types of cases to be treated. Hospitals that specialize need equipment particularly adapted to themselves, for example, institutions for mental and nervous cases utilize hydrotherapy extensively, while hospitals for tuberculous and pediatric cases may concentrate on ultraviolet therapy. In general hospitals especially those serving a high percentage of orthopedic and traumatic cases there is the greatest need for well trained technicians able to give massage, muscle training and other types of exercise. A limited amount of apparatus is needed for heat therapy, hydrotherapy (principally pools for underwater exercise), occupational therapy and muscle reeducation exercises.

To determine further requirements for any particular hospital its statistics should be studied to find the predominant types of cases treated, the daily average of bed patients who may need physical therapy, the possible number of outpatients and the financial outlay which the hospital is prepared to make. Given time a properly managed department will become a decided asset but as in any undertaking this must be shown to the management to be believed. A moderate investment will be enough to start with. Later the department may be built up as its importance is felt. From statistics gathered

<sup>16</sup> McCarrison, Herbert. *Studies in Deficiency Disease*. Oxford Medical Publications, 1921.



as aforementioned, an estimate may be made of the probable number of treatments to be given and types of cases that will be most frequently encountered and benefited

With these figures in hand, the next move will be to choose the right personnel. All the ingenuity and planning that go into creating the mechanical set-up will be wasted without a properly trained director in control. This physician, in addition to ground work in medicine and surgery, should have taken a postgraduate course in physical therapy. Although apparatus therapy is only a small part of physical therapy, it will be necessary for the director to understand the physical principles involved in the construction of the various devices as well as the clinical application of these different units. Such a background will enable him to prescribe physical measures effectively.

Smaller hospitals may not require the services of such a director. If a roentgenologist who has had some training in physical therapy is available, the physical therapy department may be combined with his. Where a man with this type of training is not available obviously some member of the staff must acquire sufficient knowledge of physical therapy to supervise the department.

Larger hospitals can afford to employ a part-time director who divides his time between several institutions. In the largest hospitals the director may have to spend his entire time in the department directing or administering treatments and in examining the patients at frequent intervals to make certain they are gaining ground. If and when no progress is being made, this first-hand knowledge serves as a check to prevent clogging the channels with "treatment habit" patients.

Quite often the referring physician will prescribe his own treatments. This does not minimize the responsibility of the director of the department. If after examining the patient he feels that the prescribed therapeutic measures are not indicated, he is at liberty to discuss this with the referring physician and suggest treatment which he feels is applicable.

The guiding hand of the director will count for nothing without the proper technical personnel. Choice of the right technician will ensure correct application of the prescribed treatments. The head technician of a department should be a graduate of an approved school for physical therapy technicians and be registered with the American Registry for Physical Therapy Technicians. The Council on Medical Education and Hospitals of the American Medical Association has published a list of approved schools of this type.<sup>1</sup> As prerequisite for admission to these schools the candidate has had to satisfy one of the following requirements:

- (a) Two years of sixty semester hours of college, including courses in physics and biology.
- (b) Graduation from an accredited school of nursing.
- (c) Graduation from an accredited school of physical education.

The training itself consists of at least 1,200 hours of theory and practice, including 210 hours of applied anatomy. A technician with this training although completely unequipped to diagnose cases has gained sufficient knowledge of anatomy

physiology and pathology to understand the theory underlying the prescribed treatment. Such background cannot be acquired in one-week courses in which a nurse is shown how to operate a few electrical machines. Nor can the run-of-the-mill masseur give adequate physical treatments. The number of treatments which one technician can give in a day will depend on the type of cases treated. On an average, adequate treatment cannot be given to more than from sixteen to twenty patients a day. If the aforementioned type of personnel is not available to the hospital considerations for starting a physical therapy department may as well be dropped until such personnel is available.

When the cooperation of the staff is assured and the proper personnel is at hand, it is time to decide on a location for the department. Unfortunately, the ideal arrangement of rooms cannot be added to old hospitals in which all available space is probably utilized. Consequently, many departments have been placed in basements. It seems timely to advise against this.

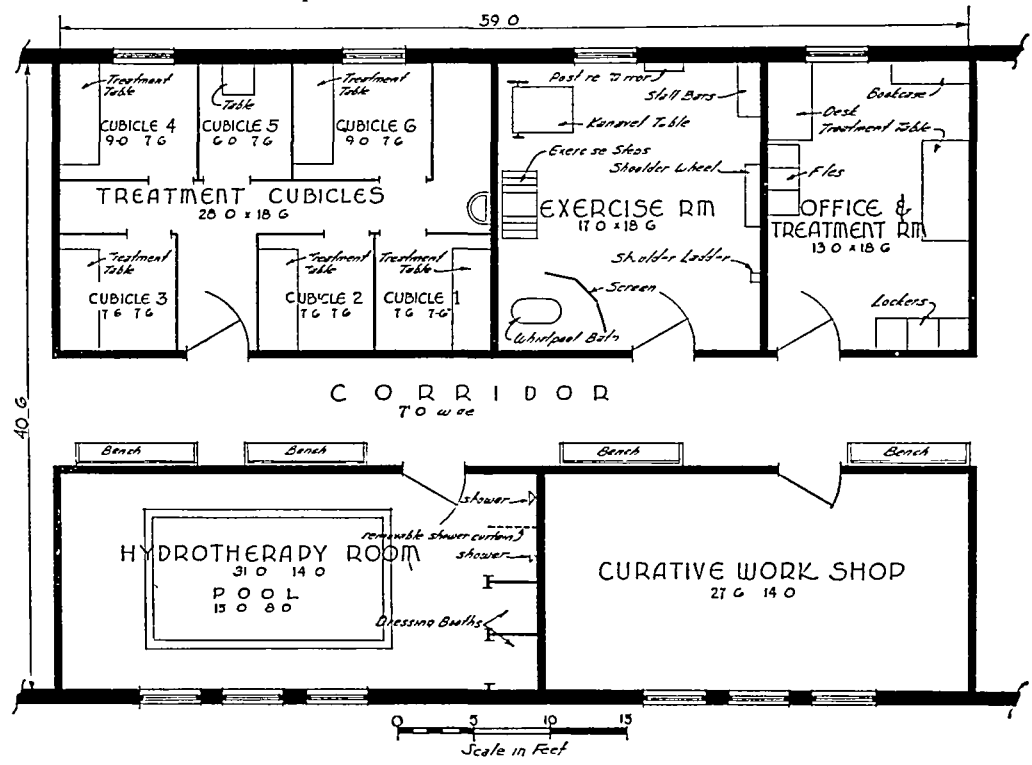


Fig 1—Suggested plan for a physical therapy department in a 20 bed hospital

The best location is on the first or ground floor. This will enable outpatients to receive treatment without going through the hospital corridors. Many of these outpatients are crippled and unable to ascend stairs. It is particularly important to have the rooms well ventilated and well lighted, because fresh air is vital where exercises are to be given.

Temperature in the rooms is apt to be higher than outside owing to the presence of heat-producing machines. Consequently the patient may not be even moderately comfortable unless there is cross-ventilation. In still air, excess heat is dissipated by the patient chiefly in the form of perspiration and very inefficiently in that form. Stagnant air next to the body becomes saturated and then perspiration does not evaporate until this layer moves off by diffusion. With moderate air motion on the other hand the patient will maintain his temperature equilibrium by the loss of heat through evaporation convection and radiation. Air motion lowers the humidity in the room thus increasing the patient's comfort.

Other considerations determining the location of the department follow. Proximity to elevators is essential since it is more convenient to bring patients to the department than to treat them in their rooms. Also it is easier for the technician to take apparatus to the patient's room or surgical floor when necessary. The relationship to the various clinics and the

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x-ray department is important. Availability of water supply, sewers, toilets, electric outlets and floor exits must also be taken into account.

If a new department is to be built, the architect should consult with the director when making plans. The two main types of departments are as follows: (1) a single large room, (2) separate rooms for each therapeutic measure. Innumerable variations lie between.

A large treatment room may be used in general hospitals or in a large free clinic. Here a certain amount of privacy is achieved by dividing the large room into a number of cubicles, either by means of sheets suspended from a 7 foot level or by steel, marble, beaver-board or other types of partitions. See treatment cubicle room on hospital plan (fig 1), in which this has been done successfully. The cubicles should measure at least 6 by 8 feet. Larger ones are preferable. If private patients are to be treated in general hospitals, several adjoining rooms may be utilized for heat therapy and massage, for hydrotherapy, for muscle reeducation exercises, for ultraviolet

level so that they may be reached without stooping. This also facilitates the movement of apparatus.

Mock stated that 90 per cent of physical therapy in general hospitals consists of common sense and intelligent handwork. Elaborate apparatus and machine therapy do not make a physical therapy department. The director is advised to keep this truism in mind when outfitting a department. The physician in charge of the department must have a clear idea of the elementary physiologic reactions of the body to heat, light, water, electric current and exercise so that he may prescribe a particular measure for a given purpose.

Probably there will be relatively few patients needing physical therapy in the fifty bed hospital. If one of the staff physicians or the roentgenologist is trained to direct the use of physical measures, it may be possible to obtain a technician for part time service. A room approximately 24 by 30 feet may be set aside for this department. Partitions of wall board or other light material form the main walls of treatment cubicles. Curtains may be used for the front wall. Desk and other equipment is then conveniently located in the remaining space (fig 3). It may not be possible to set a room aside for this department. If such is the case, only the simplest measures should be prescribed, preferably those which may be carried out in the patient's room.

Minimum requirements in equipment will consist of apparatus which can be made by the hospital carpenter and electrician, it being kept in mind that heat can be administered with wide success without much apparatus. The units decided on should be readily movable, i. e., on casters, or portable.

Two homemade bakers - one for local applications (14½ inches high by 17 inches long by 14 inches wide containing approximately four 60 watt bulbs) one for body applications (24 inches high by 30 inches long by 22 inches wide containing approximately eight 60 watt bulbs).

One paraffin bath 1½ gallon double boiler electric or gas stove 8 pounds of paraffin.

One tank for underwater exercise.

Exercise apparatus (see fourth following paragraph for list and choose simpler ones at first).

If funds are available, the two following lamps may be used in place of bakers:

Tungsten 1000 watt lamp (for 'near infrared' where deeper penetration over large body area is desired—from 10 to 30 mm according to Colblentz).

Small nonluminous infra red lamp (for far infrared applications to local areas more superficial absorption—from 3 to 0.1 mm according to Colblentz).

Other physical measures, such as massage, exercises, hot compresses and cold packs

may be supplied by the technician. If circumstances warrant and only when warranted, the following equipment may be added:

- One portable diathermy unit for medical and surgical use
- One ultraviolet mercury arc lamp
- One galvanic sinusoidal outfit.

Hospitals with beds for 100 or more patients will probably need departments set aside for physical therapy (fig 1). It is impossible to set arbitrary limits to the amount of equipment which a given hospital should require since each has its own particular set-up. In any case the equipment should be purchased from a reliable manufacturer so that the servicing and replacement of parts will be assured. One of the functions of the Council on Physical Therapy of the American Medical Association is to set standards for acceptable devices and methods used in this field. It furnishes a list of accepted apparatus containing the names of manufacturers who have attempted to construct efficient and reliable equipment for the medical profession.

2. Directions for making bakers may be secured from the Secretary of the Council on Physical Therapy, 535 North Dearborn Street, Chicago.

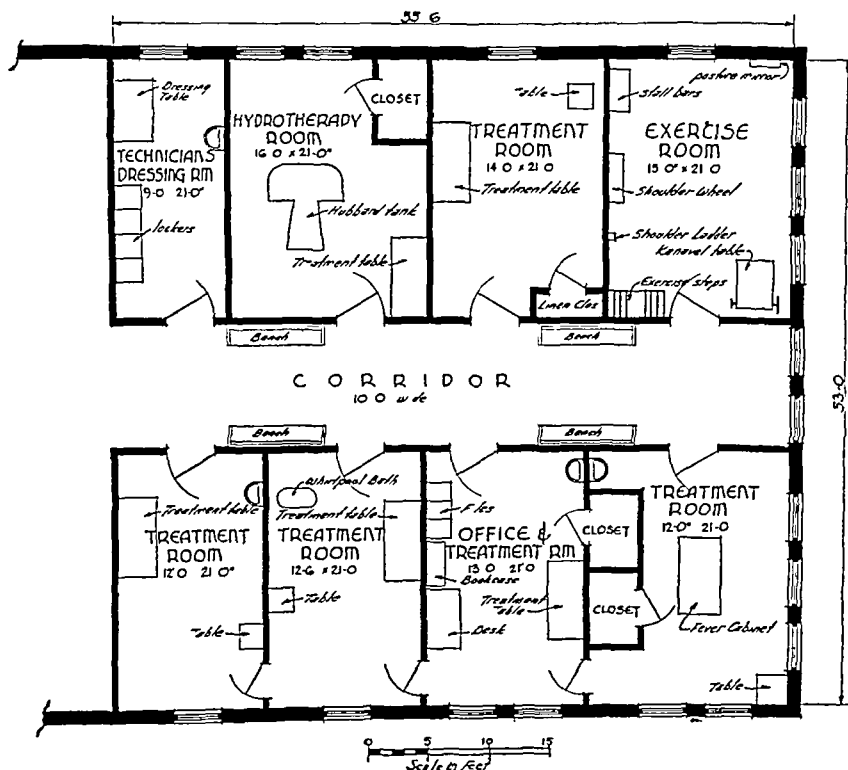


Fig 2—Suggested plan for a physical therapy department in a 300 bed hospital

treatments and for applications of high frequency currents (fig 2). In a 300 bed hospital with a department, such as seen in figure 2, many private patients receive treatments in their own rooms. In such cases the department proper does not have to be as large as that in a general hospital treating a preponderance of clinic patients.

Linoleum or some rubber composition makes a soft floor covering. The technician is on her feet all day. Consequently her efficiency is decidedly lowered by foot ailments. A hydrotherapy department needs tile or concrete floors. There may be a pool in this department for underwater exercises. Owing to the weight of the pool, this section must be placed on the ground or basement floor regardless of the location of the rest of the physical therapy department.

The plans for the wiring and placing of apparatus should be drawn with a view to the future rather than the immediate needs of the department. It is far less expensive to have too many outlets in the beginning than to tear up the walls for rewiring later. The plugs connecting the machines to the wall receptacles should be designed to fit only one outlet so that no mistakes such as blown fuses will result. Polarity plugs may be used with direct current apparatus to advantage. The outlet plugs should be placed from 3 to 4 feet from the floor

The following will give a rough idea of the appliances usually considered essential in the smaller departments in general hospitals of more than 100 beds

Four tables (33 inches high by 78 inches long by 30 inches wide) can be made by the hospital carpenter. A shelf about 1 foot from the floor should be added to table for cold cream powder and clothing. Tops of tables should be well padded and covered with nonconductive material.

One 1000 watt tungsten lamp  
One or more small luminous or nonluminous infra red lamps  
One diathermy machine for medical and surgical use  
One low frequency machine arranged for galvanic and sinusoidal currents

One ultraviolet generator (mercury vapor carbon arc or mercury glow)  
One whirlpool bath<sup>3</sup>  
Apparatus for exercising various joints shoulder wheel<sup>3</sup> exercise steps<sup>3</sup> shoulder abduction ladder Kanavel table<sup>3</sup> overhead sling and pulley for bed exercises adjustable stall bars<sup>3</sup> and posture mirror

In addition, if there are many neurologic cases to be treated, it is important to have a faradic coil to aid in muscle and nerve tests.<sup>3</sup> A Hubbard tank<sup>3</sup> is utilized for giving underwater exercises to children with infantile paralysis, congenital dislocation of the hip, tendon transplants and similar conditions in which it is important to restore muscle function without putting too great a strain on weak muscles. With the foregoing equipment, one technician can treat from sixteen to twenty patients a day. In the larger general hospital it will be useful to have a larger personnel and more complete equipment, including additional units of the foregoing types. Naturally this depends on the particular hospital but the list is a tentative suggestion.

Interference with communication by the stray energy radiated through space by diathermy, x-ray and other electrical apparatus has been decreed a nuisance in some localities. If a new building is being erected to house the department, it might be advisable to screen the treatment rooms or even the entire department by suitable conducting material, well grounded. Even when a section of an established hospital is turned over to the physical therapy department, conditions may warrant the screening of the room in which equipment is used. In many instances the good will of the local radio user, thus gained, will more than pay for the additional outlay of expense.

Hydrotherapy equipment is used more frequently in institutions for nervous and mental diseases than in general hospitals. These institutions find this a most important physical measure in treating psychoses and psychoneuroses. Equipment of the following nature is used:

Continuous (tub) baths  
Douches and sprays (providing hot and cold water in jet or spray form)  
Showers cabinet and overhead variety  
Sitz baths  
Tables rubber sheets blankets (for giving wet packs)

Elaborate hydrotherapy equipment is seldom successful in general hospitals. In smaller hospitals one hydrotherapy room may be utilized for all forms of treatments. If more room is available two rooms are advisable, one for men and one for women.

The most important equipment for a general hospital concentrating in orthopedic work is one of three types of tanks designed for underwater exercises. (1) A large pool where the technician may work in water with the patient. (2) a pool from 3½ to 4½ feet deep 8 by 15 feet in external dimensions,

where the patient may walk while the technician follows around outside the pool, and (3) a Hubbard tank, where the patient can exercise only in a recumbent position. General hospitals dealing with a preponderance of traumatic cases will concentrate on equipment such as the following:

Bakers and infra red or luminous heaters  
High frequency units  
Whirlpool baths (one for arm and one for leg cases)  
Faradic and galvanic apparatus

Exercise apparatus for muscle reeducation (A complete set will include types of appliances for exercising each joint of the body so that graded exercises can be given for any part.)

Equipment for an occupational therapy (curative) workshop

If fever treatments are to be given, ample space should be set aside. This is needed for special equipment such as the heating unit and cabinet or other devices used for elevating and maintaining temperatures, an electrical thermometer, oxygen and carbon dioxide tanks, basins, extra blankets, towels, dry sheets, and a table. In addition, it is important that there be room enough for the technician to get around quickly in case

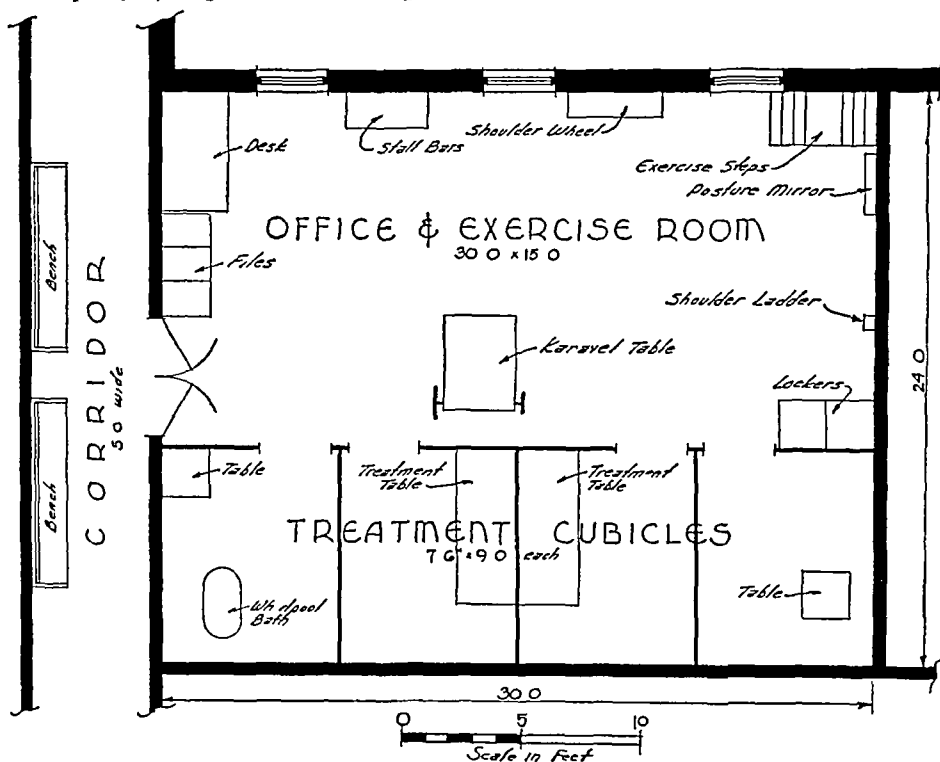


Fig 3—Suggested plan for a physical therapy department in a fifty bed hospital

of an emergency requiring rapid removal of the patient from the heat-maintaining equipment. To reduce the humidity in the room, good ventilation is essential. The Council on Physical Therapy has adopted specifications for fever apparatus and these should be consulted before acquiring equipment.

A final but a most essential consideration lies in keeping records of the cases treated. Without a carefully worked out recording system, the department cannot cooperate with the other divisions of the hospital. Records indicate the value of the treatment both to the patient and to the staff. They enable the director to keep the stream of patients moving, weeding out those who show no improvement. At the same time they point to the progress and growth or stagnation of the department itself.

In conclusion it is emphasized that 90 per cent of the physical therapy in a general hospital can be done with the simplest physical agents: heat, massage and exercise. The most important factors in a hospital physical therapy department are competent medical direction and efficient physical therapy technicians.<sup>4</sup>

<sup>4</sup> Additional references

To 1932 Coulter J S Principles and Practice of Physical Therapy Hagerstown W E Prior Company 1934 vol 3 pp 148  
To 1937 Krusen F H Physical Therapy in the Hospital Hospitals 11 54 (Aug) 1937

<sup>3</sup> Directions for making the equipment may be secured from the Secretary of the Council on Physical Therapy 535 North Dearborn Street Chicago

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 19, 1938

## RECENT RESEARCH ON HEARING

With the cathode ray oscillograph, Wever and Bray<sup>1</sup> studied electrical changes in the auditory nerve of an anesthetized animal in response to sound. They discovered a phenomenon previously unknown, "the electrical response of the cochlea." The term connotes a change of electrical potential in the cochlea which occurs 0.1 millisecond after sound is incident on the eardrum. According to Kerridge,<sup>2</sup> the change varies in direction as often as does the pressure of air on the drum. As electrical changes are converted into sound waves in every radio set, a similar method was applied to the electrical response of the cochlea. Thus sounds of the voice or of music in the same room as the ear of an anesthetized cat can be relayed to another room, where phonograph records of the reproduced sounds can be made. Although an entirely different phenomenon, the action potentials of the auditory nerve may also contribute to the registrations of the recording instrument.

When exposed to tones sufficiently loud to make them deaf to the tones, dogs were found to lose the electrical cochlear response to the tones. The electrical response for high tones is more readily picked up from the base of the cochlea than it is from the apex, while the reverse is true for low tones. When the basilar membrane or the round window is punctured the response disappears, a result which would suggest that the electrical response is dependent on the basilar membrane.

The significance of the electrical response of the cochlea is unknown. The fact that it begins 0.1 millisecond after the stimulating sound has reached the ear, while the action potential in the auditory nerve does not start until after 0.6 millisecond may indicate some process which causes the stimulation of the auditory

nerve fibers. At any rate the sound reaches the cochlea at least half a millisecond before the auditory nerve response.

By the elimination of the electrical cochlear response, many characteristics of the action potentials of the auditory nerve have been discovered. The electrical changes recorded from the nerve seem to bear no relation to the frequency of the stimulating sound when this exceeds 3,000 vibrations a second. Below this pitch, however, there is one change of potential for every sound vibration impinging on the ear up to 1,000 per second, one change for every second vibration up to 2,000 per second, and one for every third vibration up to 3,000 per second. This observation raises the question whether the mechanism of hearing is different for tones in the lower and higher parts of the auditory range. It may be that the brain recognizes the higher tones by the particular nerve fibers that was excited, and the lower tones by the rate at which impulses arrived or because of both.

Lorente de No<sup>3</sup> has demonstrated that the radial nerve fibers in the cochlea supply only the internal hair cells. The internal spiral fibers run to both internal and external hair cells. The external spiral fibers serve the external hair cells. A single ganglion cell will connect with a large number of external hair cells for a third of a cochlear turn or more. Such distribution of nerve fibers to the hair cells suggests that there is a difference of function between the inner and the outer hair cells, the former being the discriminators of pitch, the latter agents to detect weak sounds. The external hair cells are placed so as to be more free to vibrate than the inner hair cells. Lorente de No found that many of the external hair cells were degenerated in the ear of an animal which had been exposed to a loud note of constant pitch.

This mechanism for discriminating the pitch would explain the fact that man can differentiate smaller differences in pitch if the sounds are moderately loud than if they can only just be heard. There is anatomical evidence to explain the great acuity of hearing in the middle pitches, the spiral ganglion cells corresponding to the central region of the cochlea are much more numerous than others and the part of the central ganglion in the medulla connected with the fibers of the central region of the cochlea is bigger than the parts which are connected with the apex or the base.

About eighty years ago, Helmholtz provided mathematical evidence to the resonance theory of hearing. While this theory has been modified, as Kerridge points out in her review, there has been no alternative theory which has been backed by sufficient evidence or which accounted for the existence of the cochlea. A clearer understanding of the mechanism of hearing may come about as a result of the newer electrical methods of research.

1 Wever E. G. and Bray C. W. Action Currents in the Auditory Nerve in Response to Acoustic Stimulation. *Proc. Nat. Acad. Sci.* 16: 344, 1930. The Nature of Acoustic Response. The Relation Between Sound Frequency and Frequency of Impulses in the Auditory Nerve. *J. Exper. Psychol.* 13: 77, 1929.

2 Kerridge Phyllis M. Torker. Recent Advances in Knowledge Concerning Hearing and Speech. *Physiol. Rev.* 18: 9 (Jan.) 1938.

3 Lorente de No R. Anatomy of the Eighth Nerve. *Laryng. & Rhinol.* 12: 1 (Jan.) 1933.

## NEBRASKA PHYSICIANS LEAD FIGHT ON TUBERCULOSIS

The medical profession, in the pioneer days of the public health movement in the United States, was responsible for the establishment and early development of many activities. State departments of health and many of the voluntary health movements are conspicuous examples. The interest of the medical profession in the public health has never waned. Its constant fight against quackery within and without the profession, the work of its educational and scientific councils, its radio broadcasts, and other activities bearing on better medical education and better medical care are efforts in behalf of the public health. A timely example is found in recent developments in the state of Nebraska, where the state medical association is in the vanguard of the fight against tuberculosis.

Nebraska is among those states with a tuberculosis death rate under 40 per hundred thousand of population. Therefore the tuberculosis problem in Nebraska differs from that in more populous states with higher death rates. The latter can now aim only at control, while Nebraska can aim at eradication. Early in 1936, when the state board of control began planning for a long term program for the state tuberculosis hospital, advice was asked of the state medical association, the state tuberculosis society, the state department of health and the state planning board. A survey of the tuberculosis situation in Nebraska was decided on, "to obtain information which would assist the Board of Control and the State Planning Board in judging the tuberculosis problem in the state and planning for hospitalization requirements, second, to make a real case-finding survey of the state with ultimate purpose of controlling the disease." The sources used were death records of the state health department, state hospital cases and cases reported to the state health department. These sources were supplemented by questionnaires to all practicing physicians and to hospitals. Returns were made to the executive office of the state medical association, and only the statistical material was released to the state planning board. "According to the plan of making a complete case-finding survey, it was decided to make an intensive survey of one county. York County was chosen because it was the first suitable county to furnish complete information."<sup>1</sup>

Organizations furnishing either funds or personnel or both included the planning board, the state medical association, the tuberculosis association and the York County Medical Society. Volunteer graduate nurses assisted and high school pupils acted as clinic clerks. In York County a program of case finding was inaugurated according to standard correct methods. Tuberculin tests (3,707) were done and the positive reactors (683) were advised to have x-ray examination. A gratifyingly large percentage (634 persons) did so.

The population of York County is 17,239, hence roughly 20 per cent of the population, mostly at high school age, was tested. Four new and hitherto unknown cases of tuberculosis were uncovered, bringing the total known cases for York County to thirty-six, or 90 per cent of the theoretical total cases existing there, a very high percentage. Thus the first step toward the conquest of tuberculosis has been taken in York County by the acquisition of highly accurate knowledge of existing foci of the disease. A sound basis for intensive and economical control and eradication is established in this area. York County celebrated by organizing a county tuberculosis association, the first in the state. In addition to state and local medical society and tuberculosis association officials, the American Medical Association and the National Tuberculosis Association were represented at the organization meeting and the public meeting that followed.<sup>2</sup>

This movement is significant because of its cooperative character, its medical participation and leadership, its demonstration that small rural communities can function effectively for public health with appropriate aid, and its great success in achieving its primary objective. The first step has been taken in a state-wide plan for the eradication of tuberculosis in Nebraska.

## BENZEDRINE SULFATE—A WARNING

Following the appearance of items in the press during the last few weeks, many inquiries have been received concerning the use of benzedrine sulfate in the treatment of obesity. Sensational reports on the effects of benzedrine sulfate are not new to the medical press or to the daily newspapers. Some months ago THE JOURNAL published a critical editorial on benzedrine sulfate.<sup>1</sup> At that time the drug was being used unwisely to avoid fatigue, news that it could be obtained for keeping one awake while "cramming" for final examinations spread from campus to campus. The drug has been employed for such widely variable conditions as anginal pain, seasickness and apathy. Now it is suggested for weight reduction. While not as toxic as the ill famed reducing agent dinitrophenol,<sup>2</sup> nevertheless its use may be followed by serious consequences. Just as the Council on Pharmacy and Chemistry issued a report on the status of dinitrophenol, it has recently published a report on benzedrine sulfate.<sup>3</sup> The Council concluded that in the light of available evidence claims for benzedrine sulfate should be limited to its usefulness in narcolepsy, postencephalitic parkinsonism and certain depressive mental states encoun-

<sup>2</sup> Addresses were given at these meetings by Philip P. Jacobs, Ph.D. of the National Tuberculosis Association and W. W. Bauer, M.D. of the American Medical Association.

<sup>1</sup> Benzedrine Sulfate: Pep Pills editorial, J. A. M. A. **108** 1973 (June 5) 1937.

<sup>2</sup> Dinitrophenol Not Acceptable for D. N. R. Report of the Council on Pharmacy and Chemistry, J. A. M. A. **105** 31 (July 6) 1935. Dangers of Slimming Current Comment, *ibid.* **105** 804 (Sept. 7) 1935.

<sup>3</sup> The Present Status of Benzedrine Sulfate: Report of the Council on Pharmacy and Chemistry, J. A. M. A. **109** 2064 (Dec. 18) 1937.

<sup>1</sup> Tuberculosis Survey of York County, Bureau of Health and Public Instruction files.

tered in institutionalized patients. In this report it was noted that Nathanson had described a loss of appetite following the use of the drug for the avoidance of fatigue, hence it seemed to be potentially a drug which would be somewhat effective in obesity.

The recent publicity is based on the latest report by Myerson and his associates<sup>1</sup> in the Division of Psychiatric Research at the Boston State Hospital. The use of the drug in obesity is advocated on the premise that in many cases this condition is associated with anhedonia (defined by Myerson as "a diminution, even to the point of disappearance, of satisfactions normally obtained from life activities and in loss or distortion of appetites and desires"). Myerson believes that these patients have a tendency to eat too much and too often, to nibble between meals not only in an attempt to satisfy the appetite but to escape from their neurosis. Proceeding on this basis, Myerson and his associates employed a 1,400 calory diet and gave the patients benzedrine sulfate for the purpose of making them satisfied with this caloric intake, reductions were reported, averaging a pound a week. Myerson's work with this drug has been extensive, yielding much clinical evidence concerning its effects. It must be remembered that, when Myerson recommends the drug for certain purposes, he frequently refers to its use in conditions as they occur in patients coming under the purview of the psychiatrist and neurologist. It does not necessarily follow that such results may be safely or effectively produced in otherwise normal persons. The Council in recognizing the usefulness of benzedrine sulfate in the treatment of narcolepsy decries its use for sleepiness and fatigue in those who are otherwise normal. Many of Myerson's cases concerned definitely psychoneurotic patients classed as suffering from anhedonia. He treated the obesity by reducing the caloric intake, and the anhedonia by administering benzedrine sulfate. It may be assumed, therefore, that the drug might fail to reduce weight effectively in the normal person who does not suffer from anhedonia.

Myerson's report gave the details of eight of a total of seventeen cases. The diagnosis of three of these was "obesity with psychoneurosis." Other diagnoses were "obesity with hypermenorrhea," "obesity following subtotal thyroidectomy," "obesity—failure of benzedrine to aid in reducing weight" and just plain "obesity."

Benzedrine sulfate is contraindicated in many conditions, especially in cardiac conditions, which are not infrequently seen in the obese. Finally, evidence is accumulating which indicates that its use may produce craving and even addiction in some instances.

Both THE JOURNAL and the Council have previously noted that this drug is too new to pharmacology and experimental medicine to warrant any prediction as to the possible harm that may result from its long con-

tinued use. Even if benzedrine sulfate could be safely and effectively used to reduce weight there is no evidence that it will have any permanent effect on weight. Its use over long periods is certainly not without danger, particularly to the circulatory system. Physicians may well warn patients against the indiscriminate use of the preparation to control obesity. Benzedrine and its sulfate are promising drugs when used properly.

## Current Comment

### MEDICAL ACTIVITIES AT BOY SCOUT JAMBOREE

Last summer, in celebration of the founding of the Boy Scouts of America, Washington, D. C., was host to some 25,000 boys from June 30 to July 9. The medical aspects of the occasion have been reviewed by Smith.<sup>1</sup> The camp sites chosen were probably the best obtainable, but it was unfortunately necessary to scatter them in groups over a considerable area. Some of the camp sites were low, and heavy rains preceding the jamboree caused apprehension from a sanitary point of view. The camp was divided into twenty sections with approximately 1,250 boys each, and each constituted a separate administrative unit. The Health and Safety Department had three divisions: sanitation, safety and medical. The division of sanitation included sanitary engineers, sanitary inspectors and food inspectors. The division of safety was in charge of fire prevention and protection, promulgated accident and safety measures and investigated each accident. The medical division consisted of the chief medical officer, assistant chief medical officer, a part-time medical officer for emergencies, a chief medical inspector, a controller of medical supplies, two ambulance drivers, one secretary, one chauffeur, one dispatch rider and two orderlies. Each unit had a tent first aid station. Among the supplies to each unit was a quart of castor oil. But at the end of the jamboree the twenty quarts were returned intact! Epsom salt also was unpopular. The first aid stations were each manned by three physicians and four orderlies. This personnel was volunteer and came from all sections of the United States. The stations were connected with headquarters by telephone. The facilities of the naval hospital for non-contagious diseases were offered by Admiral Rosstter, and all cases of contagious nature were cared for at the Gallinger Hospital. When a scout applied for admission to the camp he was required to give a medical history and undergo a physical examination at home. Any scouts showing physical difficulties which might be expected to interfere with camp activities were rejected. In spite of this precaution, boys arrived in camp with diabetes, asthma, tuberculosis, mental conditions and also a history of recent exposure to mumps. Perhaps the errors reflected an oversympathetic attitude on the part of the examining physicians at home, but the result, as Smith points out, suggests the

<sup>1</sup> Myerson, Abraham and Leis, M. F. Human Autonomic Pharmacology. XVI. Benzedrine Sulfate as an Aid in the Treatment of Obesity. New England J. Med. 218: 119 (Jan. 20) 1918.

<sup>1</sup> Smith, W. J. Medical Activities at the Boy Scout Jamboree II. In Washington, D. C. June 30-July 9, 1937. Pub. Health Rep. 5-1824 (Dec. 17) 1937.

advisability of having future examinations made by a physician familiar with camp activities. The average daily attendance at all first aid stations was approximately 970, 78 per cent of the calls being for surgical and 22 per cent for medical treatment. The predominance of surgical conditions was due largely to the minor injuries treated, a large number of which were cuts with a scout ax. Colds were common in the first part of the camp period, and during a hot spell several sections reported simultaneously a slight elevation of temperature associated with severe vomiting in a number of their boys. The attacks were of short duration and no sanitary cause was found. One snake bite was treated, which occurred in a scout who handled snakes as an exhibit. One boy was given antirabic treatment. Only one injury from fireworks was reported, a burn of the thumb. During the two weeks, including three days before camp formally opened and one day after it closed, there were 143 admissions to the hospital. Fifteen boys were admitted to the Gallinger Hospital, ten for mumps, three for scarlet fever, one for measles and one for observation for meningitis, which proved to be only a gastro-intestinal upset. Among those sent to the Naval Hospital two were injured in traffic accidents, and there were ten fractures, nine sprains, four lacerated wounds and twelve cases of infection and cellulitis. One boy came to the jamboree with boils on his arm, acquired a staphylococcal infection of the blood stream and died about two weeks after the jamboree was over. Twenty were sent to the hospital for conditions diagnosed as appendicitis but only three were operated on. The experiences obtained will doubtless be of value on future occasions, both for this organization and for others.

#### POTENCY OF LIVER PRODUCTS

Since liver and its preparations were first introduced in therapeutics for the treatment of pernicious anemia, there has been difficulty in determining the potency of the products. The Council on Pharmacy and Chemistry a few years ago evolved a means of expression that gave the physician some measure of the potency of the product. Many hospitals and institutions using liver preparations now limit their purchases to the products accepted by the Council. The standardization of anti-anemic preparations of stomach has been placed in the hands of the U. S. Pharmacopoeia Anti-Anemia Preparations Advisory Board.<sup>1</sup> As there is no satisfactory laboratory method which may be used for this purpose it has been necessary to check the potency of these remedies by administering them to patients with pernicious anemia. Obviously this method possesses certain disadvantages, chief of which perhaps is the scarcity of suitably untreated patients. The Committee of Revision of the Pharmacopoeia provided for an advisory board to pass on clinical data which manufacturers of these products might present and if the data indicated a satisfactory degree of potency, the board would approve the product and it could be labeled

under the U. S. P. title. The important feature to both physician and patient in this program is that it is designed to insure a product of reasonably uniform potency. Under the rules of the board the amount of liver supposed to be represented in the product may not be mentioned on the label, as it is likely to be misleading, a product derived from 100 Gm. of liver is not necessarily twice as potent as one made from 50 Gm. Products will now be labeled in units, and patients should receive for a maintenance dosage an average of about a unit each day. From now on the U. S. P. label on liver and stomach products will indicate that the product has been assayed for a satisfactory degree of hematopoietic potency. In the future the Council will doubtless include in New and Nonofficial Remedies those liver and stomach preparations which comply not only with their regulations dealing with claims and methods of advertising, but also with the potency standards of the U. S. Pharmacopoeia.

### Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

#### CALIFORNIA

**Admission and Collection System Attacked in Charges of County Hospital Graft**—A grand jury investigation of the system of admission and collections at the Los Angeles County General Hospital is suggested in an article by Dr. George H. Kress, published in the February issue of *California and Western Medicine*. Dr. Kress takes exception to the practice of billing all indigents for hospitalization charges. In addition he terms the amounts charged "stupid and outrageous." He charges that since July 1, 1937, when a new system of admission and collections was introduced at the hospital the administration has overstepped its bounds in billing all indigents. Prior to July 1, billing was restricted to those hospital patients for whom bills were recommended by the hospital social service department. In answer to an inquiry from Dr. Kress the superintendent of charities stated: "It was felt that it would be more equitable to bill all patients and then arrange payments in accordance with financial ability, rather than bill only a restricted group selected on the basis of immediate financial ability." Charges were made to conform so far as possible, to the actual cost to the county of providing care, it was said. Under the new system, the client is made aware of his obligation even though there is no immediate prospect of payment. Dr. Kress criticizes this practice and asks the purpose of an elaborate system of bookkeeping to carry accounts which are known in advance to be of no value, in view of the fact that indigent or near indigent are classified as "free" patients. In some instances efforts have been made to force patients to give liens on insurance and property they may have in the future, many patients have been "bombaraded" with bills, the letters being almost mandatory in their request for payment the article asserts. The department of charities, replying to Dr. Kress, denied that the Kern County Hospital Appellate Court opinion, rendered in January 1936, which declared that county hospitals may hospitalize and care only for indigent or near indigent persons, was used as a basis for claiming reimbursement from a county client. The opinion was considered, however, when the board of supervisors adopted a new schedule of charges for hospital care, based on a cost accounting system to supersede the old flat rate of \$4 per day. In his analysis of the system at the hospital, Dr. Kress uses the total of 56,774 inpatients who received care in the fiscal year 1936-1937. For this group the average number of patient days was 147. There are 508 physicians, surgeons and specialists who give their services gratuitously to the institution the value of which to the group of 56,774 was estimated to be \$2,000,000. In contrast Dr. Kress compares the fund of \$2,865,654 collected by the Community Chest from 1,000,000 persons in Los Angeles. For the period 1936-1937 the county

<sup>1</sup> The board is composed of Dr. C. W. Edmunds, chairman; Dr. William B. Castle, Dr. Raphael Isaac, Dr. George R. Minot and Dr. W. W. Palmer. Report on Potency of Liver Products. *J. A. M. A.* 110:512 (March 12) 1938.

received \$306,974.02 on accounts for the Los Angeles County Hospital, indicating that the institution received payment from patients while the entire group of professional persons providing the care received not one cent. From July 1 to Nov. 1, 1937, bills amounting to \$1,169,921.87 were prepared by the hospital business office, on this basis the total amount of bills sent out for hospitalization to cover the entire year would be \$3,509,765.61. About 90 per cent of the statements appear to be "bureaucratic bookkeeping," Dr. Kress declares, pointing out that maintenance of the bureau that sends out these notices cost \$109,383.09, or 187 cents on the dollar collected.

### DISTRICT OF COLUMBIA

**Dr. Overholser Named Professor of Psychiatry at George Washington**—Dr. Winfred Overholser, superintendent of St. Elizabeth's Hospital, Washington, has been appointed professor of psychiatry and executive officer of the department of psychiatry at George Washington University School of Medicine, succeeding the late Dr. William Alanson White. Dr. Overholser's appointment as superintendent of St. Elizabeth's Hospital was reported in THE JOURNAL, Oct. 2, 1937, page 1132. Announcement of the university appointment, which is effective next September, was made February 24 at a luncheon in his honor. Before the luncheon Dr. Overholser delivered the Smith Reed-Russell Lecture.

### FLORIDA

**Personal**—Dr. Albert H. Freeman, Ocala, has been elected a life member of the Florida Medical Association. A past president of the association, Dr. Freeman has been a member of the profession for thirty-five years and was recommended as a life member by the Marion County Medical Society.

**Society News**—Dr. Arthur J. Logie, Jacksonville, among others, addressed the Polk County Medical Society January 12 on 'Value and Significance of the Tuberculin Test'. The Dade County Medical Society was addressed January 4 by Dr. James J. Nugent, Miami, on 'Pathologic Factors in Gall-bladder Disease'. A symposium on sulfanilamide was presented before the Duval County Medical Society February 1 by Drs. Elijah T. Sellers, Thomas E. Buckman and John C. O'Dell Jr., all of Jacksonville. Dr. Robert B. McIver, Jacksonville, discussed 'Surgical Lesions of the Kidney' before the Lake County Medical Society in Leesburg January 6. He spoke before the Gadsden-Liberty-Wakulla-Jefferson County Medical Society in Quincy January 20 on 'perinephric abscesses'. Dr. James L. Borland, Jacksonville, also addressed this meeting on 'Differential Diagnosis of the Dysenteries'.

### ILLINOIS

**Inspection of Diagnostic Laboratories**—A plan to inspect and appraise the public and private diagnostic laboratories in Illinois has been announced by the state department of health. The immediate object is to improve and standardize laboratory tests for syphilis. Each laboratory that volunteers to participate in the plan will be inspected at intervals by a representative of the state department of health. Assistance will be offered when needed, and standard antigen for making blood tests for syphilis will be provided by the department. Certificates of approval will be issued by the department to each laboratory maintaining the required technical and professional standards and a register of all approved laboratories will be kept. There are about 225 of these laboratories in the state.

#### Chicago

**Branch Meetings**—The Evanston Branch of the Chicago Medical Society was addressed February 3 by Drs. Thomas E. Jones, Cleveland, on 'Carcinoma of the Rectum', Stanley E. Monroe, Evanston, 'Significance of Peritoneal Exudates as an Aid in Prognosis', and Jerrold P. Nesselrodt, Evanston, 'The Pelvic Lymphatics'. At the meeting March 3 the speakers were Drs. John S. Coulter, Chicago, and John R. Merriman, Evanston, on 'Experience with Artificial Fever Therapy', and Lowell D. Snorf, on 'Common Disorders of the Colon'. Dr. Emil Ries addressed the Englewood Branch March 1 on 'Gynecological Backaches and Treatment'.

**Society News**—Dr. Gregory Zilboorg, New York, among others, participated in an all day conference sponsored by the Council of Social Agencies of Chicago February 23. His subject was 'Psychiatry and Human Behavior'. The Chicago Council of Medical Women was addressed March 4 by Lillian Eichelberger, Ph.D., on 'Experimental Hydronephrosis' and

Dr. Julia Faith S. Fetterman, Philadelphia, "Symptoms and Signs of Urinary Disease in Women". A symposium on hyperparathyroidism was presented before the Chicago Urological Society February 24 by Drs. Fuller Albright and Richard Chute, both of Boston. Dr. John R. Norcross addressed the Chicago Orthopaedic Society March 11 on 'Sympathetic blastoma', Dr. John J. Fahey, "Muscular and Skeletal Changes in Arachnodactyly," and Dr. Harold A. Sofield, 'Steel Pin Fixation for Fractures of the Neck of the Femur'.

### INDIANA

**Society News**—A symposium on public health aspects of tuberculosis case finding and treatment was presented before the Indianapolis Medical Society, March 15, the speakers were Drs. Herman G. Morgan, Argal E. Hubbard and Willis D. Gatch. The Indianapolis Ophthalmology and Otology Society will present the program March 22, speakers will include Dr. Bernard J. Larkin on 'The Eye as an Index of Systemic Pathology'. Dr. Fred L. Adair, Chicago, will address the Indianapolis Medical Society March 29 on 'Maternal, Fetal and Neonatal Morbidity'.

**Forty Years with State Hospital**—Dr. Max A. Bahr, superintendent of the Central State Hospital and professor of mental and nervous diseases and head of the department of psychiatry, Indiana University School of Medicine, Indianapolis, completed forty years as a member of the staff of the state hospital March 1. He served first as assistant physician and later as clinical psychiatrist at the hospital, becoming superintendent in 1923. He was president of the Indianapolis Medical Society in 1932 and president of the Indiana State Conference on Social Work in 1935. According to the state medical journal Dr. Bahr conducted the first clinical courses in forensic psychiatry for lawyers in America.

### IOWA

**Refresher Courses**—A series of courses in pediatrics and obstetrics will again be offered at various centers this spring under the auspices of the speakers' bureau of the state medical society, the Iowa Pediatric Club, the State University of Iowa College of Medicine, the Central Association of Obstetricians and Gynecologists and the state department of health. There will be eight two hour lectures, four on pediatrics and four on obstetrics. Dr. Everett D. Plass, professor of obstetrics and gynecology at the state university college of medicine, will direct the courses in this subject, and various pediatricians throughout the state will present the pediatric lectures.

**Isolation Replaces Quarantine for Scarlet Fever**—The Iowa State Department of Health has instituted a new system of isolating all persons infected with scarlet fever, replacing the quarantine plan. In the past only those who had scarlet fever rash were quarantined, with the result that many mild cases that were not isolated and many patients who did not have the rash but who harbored the germ of scarlet fever in the throat spread the disease. Isolation will now apply to all persons having any symptom or sign suggesting scarlet fever, including cases without rash. In the future a placard giving notice of scarlet fever in a home will supplant the former method of twenty-one day quarantine. The placard will remain posted at the patient's home for a minimum of twenty-one days from onset of symptoms. Under the new system it will be possible for the breadwinner to enter and leave the home provided he is not a food handler, does not come in contact with groups of children and gives evidence of immunity to scarlet fever. The change was effective March 15.

### KANSAS

**Society News**—The Bourbon County Medical Society was addressed in Garnett January 25 by Drs. Tony G. Dillon and Hjalmar E. Carlson, both of Kansas City, Mo., on 'Modern Treatment of Gonococcal Infections' and 'Differential Diagnosis of Lower Abdominal Pain' respectively. Dr. Wendell M. Tate, Peabody, gave a summary of the literature on insulin shock therapy before the Marion County Medical Society in Marion February 2 and Dr. Russell R. Nykamp, Peabody, discussed tuberculosis control. At a meeting of the Pratt County Medical Society in Pratt January 28, Dr. Clarence W. Hall, Hutchinson, spoke on 'Clavicular Fractures'. The Sedgwick County Medical Society was addressed in Wichita March 15 by Drs. Earl L. Mills on 'Diagnostic Hints from Blood Pictures' and Wayne C. Bartlett, 'Metastases of Carcinoma of the Breast'. The society was addressed March 1 by Drs. Hal F. Marshall on 'Sinusitis—A Practical Viewpoint' and Willard A. Phares on 'Etiology of Gastric and Peptic Ulcers'. All are of Wichita.



## KENTUCKY

**Physicians Honored**—Drs William C Ussery, Paris, and Wilson G Dailey, Millersburg, were guests of honor at a dinner and meeting of the Bourbon County Medical Society in Paris, February 18. Dr Dailey was the first president of the society in 1903 and Dr Ussery has been president five times. At the meeting Dr Charles G Daugherty read a history of the society and a paper presented by Dr Ussery in 1905 on "Methods of Conducting the Bourbon County Medical Society." Dr Dailey read a paper he wrote thirty-five years ago on "Experiences of a Mountain Physician." Drs James A Orr, Paris, and Charles A Vance, Lexington, paid tribute to the guests of honor. Dr Byron N Pittenger, Paris, president of the society, presided.

## MINNESOTA

**Society News**—Dr Edward A Regnier, Minneapolis, presented a paper before the Minnesota Academy of Medicine in St Paul February 9 entitled "Clinical Tetanus. A Survey, Report of Cases with Unusual Early Symptoms."—Dr William A Pusey, Chicago, addressed the Hennepin County Medical Society March 7 in Minneapolis on "A Balance Between Clinical and Laboratory Medicine." The society was addressed February 9 by Drs Paul F Dwan and Erling S Platon on "Treatment of Rheumatic Fever" and "Newer Developments in the Treatment of Epidemic Meningitis" respectively.

**The Jackson Lecture**—Dr Roy Graham Hoskins, research associate in physiology, Harvard University Medical School, Boston, delivered the annual Clarence M Jackson Lecture at the University of Minnesota Medical School, Minneapolis, February 16, under the auspices of Phi Beta Pi, his subject was "Hormone Factors in Personality." The lecture was established several years ago in honor of Dr Jackson head of the department of anatomy. Dr Hoskins addressed a joint meeting of the Minnesota Pathological Society and the Hennepin County Medical Society February 15 on "Hormones in Modern Pathology."

## MISSOURI

**Health Forum**—A series of free lectures will be presented through the Jackson County Health Forum, a newly organized project to advance medical and health knowledge for the public. Sponsored by the auxiliaries of the accredited hospitals of Jackson County, the lectures will be presented by guest speakers the third Wednesday night of every month except July and August. As an adjunct to the forum, the auxiliaries will maintain office hours every day in the Argyle Building for the benefit of the public to offer suggestions for health education. The Jackson County Medical Society has approved the project, but definite dates of the lectures have not been announced.

**Society News**—Dr Jonathan C Meakins, Montreal, discussed 'Basic Sciences and Clinical Medicine' before the Kansas City Academy of Medicine January 21. Dr Joseph Earle Moore, Baltimore discussed 'Latent Syphilis' at a meeting February 18.—The St Louis Medical Society was addressed March 1 by Drs Lee Pettit Gay on 'The Dietary Control of Essential Hypertension,' Lawrence Schlenker 'X-Ray Sputum and Pneumothorax,' and Oscar D Meyer, 'Syphilis (A Probable Cause of Many Accidents).'"—The South Central Counties Medical Society was addressed in Houston February 3 by Drs Oswald P J Falk, St Louis, on 'The Treatment of Hypertension and Its Complications,' Clinton K Higgins, St Louis, 'The Present Day Therapy of Varicose Veins' and Andrew B Jones, St Louis 'The Neuroses of Mild Mental Illnesses.'—At a meeting of the Cape Girardeau County Medical Society in Cape Girardeau February 14 Dr Lawrence D Thompson St Louis discussed pneumonia.—Dr William A Hudson Detroit, discussed 'Collapse Therapy—Its Principles and Application in the Treatment of Pulmonary Tuberculosis' before the St Louis Trudeau Club March 8.

## NEW JERSEY

**Society News**—Dr Foster Kennedy, New York, addressed the Academy of Medicine of Northern New Jersey at its twenty-seventh anniversary meeting in Newark March 18 on 'The Preventive Aspects of Neurological Medicine.' Dr Sara M Jordan Boston addressed the academy March 8 on 'Treatment of Constipation and Other Functional Disorders of the Colon.'

**Survey of Tuberculosis in High Schools**—A report was recently published showing the results of a tuberculosis survey among high school students in Jersey City made under the

direction of the board of managers of the Hudson County Tuberculosis Hospital and Sanatorium. The state and county medical societies, the Hudson County Tuberculosis League, the board of education and city authorities cooperated in the campaign. A course on Mantoux testing and interpretation was offered to physicians and an educational campaign was carried out in the schools. Of a total enrolment of 14,952 students, 12,542 were tested, 4,643 reacted positively. The adult type of tuberculosis was found in sixteen students, childhood type in 255, tuberculous glands in two, pleurisy in seventeen. The results were doubtful in fourteen cases. Reports were made whenever possible to the private physicians named by students on their consent cards. It was recommended that follow-up work be done by the family physicians but when this was not possible arrangements were made with clinics.

## NEW MEXICO

**Outbreak of Botulism in Tucumcari**—Nine persons died recently in an outbreak of botulism caused by home canned chili served to twenty-four persons at a funeral luncheon in Tucumcari. Three others became ill but recovered, two developed slight symptoms, but it was not certain that they had eaten of the chili. Six others reported that they probably had eaten some and received prophylactic antitoxin. Four did not taste it. Those who ate the chili in what might be considered ordinary amounts became ill almost exactly eighteen hours later, according to the report of the state department of public health. The others who ate smaller amounts were sick later. The first symptoms were disturbances of vision, slow and regular pulse at first, but becoming irregular and faster, subnormal temperature. Tightness in the throat developed, followed by difficulty in swallowing first and then in talking. There was no pain and the mentality was clear. The cause of death in each case was respiratory paralysis. Following the clinical diagnosis of botulism by the attending physicians samples of the suspected chili were forwarded to the state laboratory at Albuquerque and to the U S Food and Drug Administration office in Denver. Both laboratories confirmed the diagnosis and stated that the causative toxin was of type A.

## NEW YORK

**Personal**—Dr James H Lade, recently on the syphilis staff of Johns Hopkins Hospital, Baltimore, has been appointed medical consultant to the division of syphilis control in the state department of health.—Dr John S Cunningham, epidemiologist in the Connecticut State Department of Health, Hartford, has been appointed district health officer in charge of Livingston, Monroe and Wayne counties.

**Society News**—Dr Henry D Niles, New York, addressed the Medical Society of Sullivan County, Liberty, March 9, on "Physical Therapy in Relation to Dermatology Exclusive of X-Rays and Radium."—Dr Henry W Miller, Brewster, addressed the Putnam County Medical Society in February on "Psychiatry and the General Practitioner."—Dr Hyman Sneiderman, Binghamton, addressed the Broome County Medical Society March 8 on "Intestinal Obstruction."

**Professor of Anatomy Appointed**—Dr Philip B Armstrong, professor of anatomy at the University of Alabama School of Medicine has been appointed professor of anatomy at the Syracuse University College of Medicine. He succeeds Dr Henry W Stiles, who retired July 1, 1937. Dr Armstrong graduated from Cornell University Medical College, New York, in 1926 and was on the staff of the department of anatomy there until 1937. He will go to Syracuse July 1.

## New York City

**Biggs Memorial Lecture**—Dr Thomas M Rivers, director of the Hospital of the Rockefeller Institute for Medical Research will deliver the annual Hermann Michael Biggs Lecture of the New York Academy of Medicine, April 8. His subject will be 'Virus Diseases.'

**Harvey Society Lecture**—Wendell M Stanley, Ph D associate member of the Rockefeller Institute for Medical Research Princeton, N J, delivered the sixth Harvey Lecture of the current series at the New York Academy of Medicine March 17. His subject was 'The Isolation and Properties of Tobacco Mosaic and Other Proteins.'

**Mental Hygiene Clinics Established**—Mental hygiene clinics have recently been established at Morrisania and Queens General hospitals—the city department of hospitals announces. The new clinics which will be subdivisions of the psychiatric division of the department of hospitals will have two psychiatrists a psychologist two psychiatric social workers, two nurses and two stenographers. Dr Hyman L Rachlin is in

charge at Morrisania and Dr Charles Schultz at Queens. Previously clinics have been provided only at Bellevue and Kings County hospitals.

**Academy Medal Awarded to Dr Schick**—The New York Academy of Medicine at a meeting March 3 awarded its gold medal to Dr Bela Schick in recognition of the twenty-fifth anniversary of his announcement of the Schick test for susceptibility to diphtheria. The presentation was made by Dr James Alexander Miller, president of the academy, who pointed out that the Schick test laid the basis for the present day effective campaign of prevention against the disease. Dr Schick, a native of Hungary, practiced in Vienna from 1902 to 1923 and was professor of pediatrics at the University of Vienna for the last five years of that period. In 1923 he came to the United States. He is pediatrician in chief at Mount Sinai Hospital and Sea View Hospital, consulting pediatrician at Willard Parker Hospital and the New York Infirmary for Women and Children.

## OHIO

**New Medical Library Is Memorial to Dr Brittingham**—The Harold H. Brittingham Medical Library was dedicated at City Hospital, Cleveland January 25, with ceremonies at which Dr Howard T. Karsner, professor of pathology, Western Reserve University School of Medicine and Mr Fred W. Ramsey, director of public health and welfare gave the principal addresses. After Dr Brittingham's death in January 1937, a fund of \$7,000 was collected to establish the library as a memorial to him. The city agreed to furnish library space and a librarian, and a membership plan was devised to provide continued support. The library already contains more than 1,000 volumes and receives forty-five current journals. Dr Brittingham was a member of the staff of the hospital from 1923 until his death and since 1935 had been assistant head of the department of medicine.

## OKLAHOMA

**Society News**—Drs Wann Langston and Harry Wilkins, Oklahoma City, addressed the Pittsburg County Medical Society, McAlester, January 25, on 'Coronary and Heart Diseases' and 'Injuries of the Spinal Cord' respectively. At a meeting of the Woods County Medical Society, Alva, January 25, the speakers were Drs Green K. Dickson and John H. Lamb, Oklahoma City, on surgery of the intestine and skin diseases in children, respectively. Drs Ivo A. Nelson and Walter S. Larrabee, Tulsa, addressed the Muskogee County Medical Society, January 17 on 'Pathology with Special Reference to Autopsy' and 'Breast Tumors' respectively. Dr Willis C. Campbell, Memphis, Tenn., will address the Tulsa County Medical Society March 28, on 'Fractures In and About the Neck of the Femur'. Dr Joseph M. Hill, Dallas, Texas, addressed the society, January 24, on 'Hemolytic Anemia'.

## PENNSYLVANIA

**Society News**—Dr David Riesman, Philadelphia, addressed the Delaware County Medical Society, Chester, March 10 on 'The Family Doctor, Past and Future'. Dr Curtis C. Mechling, Pittsburgh, addressed the Washington County Medical Society, Washington, March 9, on 'Office Proctology'. Drs Louis H. Clerf and Howard W. Bradshaw, Philadelphia, addressed the Northampton County Medical Society, March 18 on 'Pulmonary Infections and Their Treatment'. Drs Jesse G. M. Bullowa, New York and Edith MacBride-Dexter, Harrisburg, addressed the Cambria County Medical Society, Johnstown, March 10, on pneumonia control.

### Philadelphia

**Postgraduate Institute**—The Philadelphia County Medical Society will conduct its third annual Postgraduate Institute at the Bellevue-Stratford Hotel, March 28 to April 1. The general subject will be 'Diseases of the Digestive Tract' presented in eighty-seven lectures by Philadelphia physicians and in technical and scientific exhibits. Members of all county medical societies are invited to attend. The registration fee will be \$5.

**Society News**—Drs Arthur Bruce Gill and Francis C. Grant addressed the Philadelphia Academy of Surgery, March 7, on 'Buried Hardware and Diagnosis and Treatment of Chronic Subdural Hemorrhage' respectively. Dr John J. Dailey, McAdoo, was elected president of the Association of Ex-Resident and Resident Physicians of the Philadelphia Gen-

eral Hospital at the recent annual dinner. Dr George Wilson, Philadelphia, was reelected secretary.

**Personal**—Dr Emily P. Bacon has been elected a life member of the board of trustees of Wilson College, Chambersburg, and will receive the honorary degree of doctor of science at the college commencement in June. Dr George M. Dorance was honored with a testimonial dinner February 17 by the staff of St. Agnes' Hospital marking his thirtieth year of service at the hospital. He received a surgical kit as a memento. Dr Harold L. Goldburgh has been appointed senior attending physician to the medical service of the Jewish Hospital. Dr John L. Laird has been appointed chief of the division of laboratories in the city department of health. Dr George Morton Illman, associate professor of medicine, Temple University School of Medicine, has been elected a member of the board of trustees of the university.

**Professor Richards Wins Philadelphia Award**—Alfred Newton Richards, Ph.D., professor of pharmacology, University of Pennsylvania School of Medicine, has received Philadelphia's highest civic honor, the Philadelphia Award founded in 1921 by the late Edward W. Bok. The award consisting of a gold medal, a scroll and \$10,000, was conferred on Dr Richards in recognition of his research on diseases of the liver and kidneys. Edwin G. Conklin, Ph.D., emeritus professor of zoology, Princeton University, Princeton, N. J., made the presentation at a meeting at the Philadelphia Academy of Music March 9. Dr Richards, 61 years old, is a native of Stamford, N. Y., and was educated at Yale University and Columbia University. After teaching several years at Columbia and at Northwestern University, Evanston, Ill., he became professor of pharmacology at Pennsylvania in 1910. He has received various honorary degrees including that of doctor of medicine from the University of Pennsylvania in 1932. In 1932 he received the Gerhard Medal in 1933 the Kober and Keyes medals and in 1934 the John Scott Medal. The Philadelphia Award is conferred on a person "living in Philadelphia, its suburbs or vicinity, who, during the preceding calendar year, shall have performed or brought to its culmination an act or contributed a service calculated to advance the best and largest interests of the community of which Philadelphia is the center."

## RHODE ISLAND

**Society News**—Dr Maxwell F. Gland, Boston, addressed the Providence Medical Association, February 7, on 'The Specific Treatment of Pneumococcus Pneumonia', Esther Brintzenhoff, A.M., and Dr Charles F. Gormly, Providence, on 'Bacteremia in Pneumonia and 'Nonspecific Measures in the Treatment of Pneumonia' respectively. Dr Emilio D'Errico, Boston, addressed the Washington County Medical Society, Westerly, January 12, on 'Induction of Labor with Special Reference to the Artificial Rupture of the Membranes'. Dr Hugh F. Kiene, Providence, recently addressed the Rhode Island Society for Neurology and Psychiatry in Providence on 'Insulin Shock Treatment in Schizophrenia'.

## SOUTH CAROLINA

**Personal**—Dr Henry W. Tobias, medical officer at the Veterans Administration Facility, Batavia, N. Y., has been transferred to the facility at Columbia, replacing Dr Omar L. Herndon who has been transferred to Tuscaloosa, Ala. Dr Wofford E. Baldwin, formerly of Due West, has been appointed health officer of Dorchester County.

**Tuberculosis Institute**—Philip P. Jacobs, Ph.D., director of personnel training and publications of the National Tuberculosis Association, New York, is conducting an institute for health workers at the University of South Carolina, Columbia, March 14-26 in cooperation with the state tuberculosis association. Among the speakers are Drs Paul P. McCann, Sanatorium, N. C., on 'Hospitalization and Institutional Care' and 'Tuberculosis Among Negroes', and William Atmar Smith, Charleston, on the medical and scientific basis of the tuberculosis movement.

**Society News**—Dr Ruskin G. Anderson, Spartanburg, among others, addressed the Spartanburg County Medical Society, Spartanburg, January 24 on 'Acute Laryngotracheobronchitis'. Drs Ralph Mosteller, Spartanburg, and Thomas R. W. Wilson, Greenville, addressed the Anderson County Medical Society, Anderson, February 9 on 'Blood Diseases' and 'Pathology of Infections of the Upper Respiratory Tract' respectively. Dr Bernard B. Raginsky, Montreal, Canada, addressed the Greenville County Medical Society, Greenville, February 7 on 'The Present Status of Anesthetics in Anesthesia'.

## TENNESSEE

**Fund Raised for Meharry Cancer Clinic**—A gift of \$20,000 from Mr Edward S Harkness, New York philanthropist and \$10,000 raised among friends and alumni have made possible the establishment of a cancer clinic at Meharry Medical College, Nashville. According to Dr John J Mulowney, president of the college, Mr Harkness offered his gift after reading an annual report of the college setting forth the need, making a condition that the college raise \$10,000.

**Society News**—Drs Fray O Pearson, Livingston, and Venable L Lewis, Crossville, addressed the five-county medical society representing Putnam, Cumberland, Jackson, Overton and White counties in Cookeville January 20 on Rocky Mountain spotted fever and sulfanilamide, respectively—Dr Ola E Ballou, Clinton, discussed 'Diseases of the Cervix' at a meeting of the Anderson County Medical Society, Clinton, February 7—Drs Joseph R Bowman, Johnson City, and Horace B Cupp, Mountain Home, addressed the Washington County Medical Society, February 3, on 'Lipoid Pneumonia' and "Tannic Acid in Treatment of Burns" respectively—At a meeting of the Carroll, Henry and Weakley Counties Medical Society, McKenzie, February 8 the speakers, all of Nashville, were Drs Carl R Crutchfield on 'Surgical Management of Duodenal Ulcer', Jefferson C Pennington, "Management of Stones in the Upper Renal Tract," and Jack Witherspoon 'Common Duct Stones'—Drs Charles K Lewis and Charles H Heacock, Memphis, addressed the Memphis and Shelby County Medical Society, January 18, on 'Osteomyelitis of the Frontal Bone Following Sinusitis' and "Treatment of Carcinoma of the Breast" respectively.

## TEXAS

**Personal**—Dr and Mrs Thomas B Taylor, Bastrop, recently celebrated their fiftieth wedding anniversary—Dr Emil Aronson, Dallas, celebrated the fiftieth anniversary of his medical practice recently with a dinner attended by colleagues and other friends—Justin F Kimball LLB, Dallas was guest of honor at a dinner meeting of the Dallas Chamber of Commerce, February 24, in recognition of his work in the development of group hospitalization. The American Hospital Association conferred on him at that time an honorary life membership. Dr Bert W Caldwell Chicago, executive secretary of the association, and Mr Robert Jolly, superintendent of the Memorial Hospital, Houston were among the speakers. Mr Kimball is executive vice president of Baylor University in charge of the scientific schools and hospitals in Dallas.

## ALASKA

**Personal**—Dr Howard G Romig Anchorage, has been appointed a member of the Alaska Board of Medical Examiners succeeding the late Dr Arthur D Haverstock.

## GENERAL

**Orthopedic Board Examination**—The American Board of Orthopaedic Surgery will hold examinations in Chicago June 10-11. Application must be submitted before April 1 to the secretary, Dr Fremont A Chandler, 6 North Michigan Avenue Chicago.

**Warning of Impostors**—A North Carolina physician recently reported that hospitals in that state have been defrauded by a man who visits a hospital on Sunday, saying that he or his son will enter the hospital the next day and giving the name of a local physician. When asked to pay for a room a week in advance he presents a check drawn on a local bank for about \$20 more than the hospital bill, thus collecting the change. This man has used the names Martin and James—A fraudulent instrument repair man is reported to be operating in the Southeastern states. In Jacksonville, Fla., he recently used the name Morrison claiming that he represented a firm called Morrison and Company 417 Spring Street Atlanta specializing in repair of instruments at a low price. It is stated that this firm does not exist.

**Helium for Medical Use Procurable from U S Bureau of Mines**—By an act approved Sept 1, 1937, the Bureau of Mines U S Department of Interior, was authorized to maintain and operate helium production and repurification plants and to sell any helium produced but not needed for government use, for medical scientific and commercial uses. Regulations governing the production and sale of helium for such uses were approved by the President, January 14. Persons, firms, corporations, associations or institutions desiring to purchase what the regulations refer to as 'market helium' must make application therefor on forms procurable from the U S Bureau of

Mines, Washington, D C. On receipt of such an application, the bureau will determine whether or not the desired quantity of helium can be supplied and so far as practicable applications for helium for medical use will be given preference over applications for helium for other nongovernmental uses. If the bureau can supply the requested helium, it will so notify the applicant and furnish him with estimates of the cost and of the delivery schedule and notify him of the amount of the deposit required. If the applicant desires to purchase the helium under the terms named, he must execute the necessary contract within ten days. Shipping containers for market helium sold for nongovernmental uses must be supplied by the purchaser, unless otherwise agreed on by the Bureau of Mines in writing, but whether or not containers are furnished by the purchaser or by the government, the government will not assume liability for delays in delivery, loss of containers, faulty or leaky containers, loss of helium in transit or variations in purity. Any helium sold by the Bureau of Mines for nongovernmental purposes that has not been lost or dissipated may be repurchased by the government at any time if needed for government use.

**American College of Physicians**—The twenty-second annual session of the American College of Physicians will be held in New York April 4-8 at the Waldorf-Astoria. There will be general sessions Monday afternoon and evening and each morning thereafter, at which about fifty scientific papers will be delivered. Each day after-Monday there will be round table luncheons for discussion of a variety of topics. In the afternoons a course of lectures will be presented at the Waldorf-Astoria. In addition, one or more clinics will be conducted each day at Bellevue, New York, Mount Sinai and Presbyterian hospitals, during the meeting. St. Luke's, Roosevelt New York Post-Graduate and Long Island College hospitals will offer one clinic each. A new feature this year will be special demonstrations at Bellevue, New York, Presbyterian and Mount Sinai hospitals. Among the topics for these demonstrations are therapeutic use of oxygen and helium, fever therapy, high voltage x-ray machine, assay of sex hormones, a metabolism unit for research, technical methods for studying the functions of the liver in disease, cutaneous syphilis and bronchiectasis. The annual convocation will be held Wednesday evening April 6, with Karl T Compton, Ph D, president of Massachusetts Institute of Technology, Cambridge, as the orator. Dr Compton's subject will be "Possibilities in Biological Engineering." At this session the Phillips Memorial Medal for 1937-1938 will be awarded to Dr Harry Goldblatt, professor of experimental pathology, Western Reserve University School of Medicine, Cleveland. Dr James Howard Means, Boston, president of the college, will deliver his official address. The annual banquet will take place Thursday evening with Dr James Alexander Miller New York, as toastmaster. John H Finley, LL D editor of the New York Times, will give the address of the evening on "Education in a Changing World."

## FOREIGN

**The Croydon Typhoid Epidemic**—The conclusions of an investigation into the recent epidemic of typhoid at Croydon, England, in which 344 cases with forty-three deaths had been reported up to February 5, were published in the *British Medical Journal* February 19. It was found that the public water supply had been contaminated by water from one of its main sources, a chalk well at Addington, in which a typhoid carrier was working. Changes in the construction of the well were in progress during the last days of September and the month of October. During this time it was not possible to pass the output of the well through the filtering and chlorinating apparatus. For the first half of the period the water was pumped away while the work was in progress but from October 16 to November 3 it was pumped into the general supply. Sanitary facilities for the workmen were such that contamination of the water was possible, it appears from the report. During the inquiry it was brought out that the medical officer of health was unaware that work was being done on the well and that even the borough engineer did not know that the chlorinating plant was not in operation. The first case of typhoid was reported October 27, followed by others on succeeding days. The medical officer and the engineer learned of the possibility of contamination of the well water October 31 and chlorination was applied immediately. By November 4 the primary sources of infection had ceased to operate and it was considered that water in mains and cisterns played no part after that date. The report concluded with the statement that "The infection was due to an unfortunate and rare coincidence of three factors—(a) constructive changes taking place in the well, (b) one of the workmen being a typhoid carrier, and (c) the process of chlorination being in abeyance."

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 19, 1938

#### The Medical Aspects of Decline of Population

At the section of Obstetrics and Gynecology of the Royal Society of Medicine an important discussion took place on the medical aspects of decline of population, in which sociologists, gynecologists and physicians took part. It was opened by Prof. A. M. Carr-Saunders, sociologist, who said that the decline of the birth rate in many countries of northwestern Europe had been in the neighborhood of 50 per cent within the last sixty years. There might be many causal factors. There might be a decrease in the natural capacity for child-bearing. Conceivably less fertile varieties might become more numerous by selection or mutation. But he could not think that this cause had been seriously operative within the last two or three generations. The second possible cause was a decrease in intercourse, including a decline in marriages. But the tendency had been to more marriages during the period of declining fertility. The third possible cause was the use of contraceptives or altered modes of life which were inimical to fertility. The fourth possible cause was greater frequency of abortion.

Though about twenty speakers took part in the discussion, the new light that was thrown on the subject was limited. Prof. J. C. Drummond, biochemist, made the new and important suggestion that changes in our national diet had an influence on fertility, particularly shortage of vitamins B and E. No fallacy was more widely held than that a mixed diet afforded protection against all forms of dietary deficiency. In the common foodstuffs, few were rich in vitamin B or E. These were present in considerable amount in only one food—the germ of most of the cereals. The decline of the birth rate first became evident about fifty or sixty years ago, which corresponded with the time when the change over from whole meal to white bread rapidly occurred as a result of the introduction of the roller mill. The removal of the germ, which the new process made possible, brought about a sharp decline in the amount of these vitamins in the everyday diet. The intake of a poor person, living largely on bread, fell from about 800 to 250 international units daily.

Prof. James Young, gynecologist, said that abortion and contraception were generally believed to constitute the effective influence in the declining birth rate. In a survey of reproductive histories in a medical unit he found that the abortions constituted 10.8 per cent of the pregnancies. Abortion appeared to be increasing and there was evidence that dietetic factors might be concerned, namely, the success obtained by treatment with vitamin E and the high proportion of development defects found in aborted ova which might be ascribed to nutritional deficiency.

Sir Leonard Hill, physiologist, referred to the aging of our population—the decrease in the number of children and the greater longevity of the old. For many years all the energy had been put into the prevention of death, not into the production of young life. Probably making people live to a greater age reduced births. But birth control was at the bottom of the diminution of the birth rate. He urged the adoption of the methods used in Germany and Italy—family allowances, reduction of taxes, dowries for marriages, bonuses for children, creches where mothers could leave their children, the removal of disabilities attaching to illegitimacy, and the prohibition of the condition for employment that the candidate must be unmarried.

#### Compensation for Miners' Nystagmus

The committee appointed by the government to investigate miners' nystagmus has presented its report. The committee

finds that the low standard of illumination underground is the main cause of nystagmus. The standard necessary to prevent it has not yet been reached, and the use of the electric cap lamp should be encouraged. A case should not be certified unless oscillations persist for a definite period. Medical boards, empowered to give a conclusive decision, should be set up in the different coal fields to ascertain the extent of disablement to make periodic examinations and to advise when a man is fit for work. As work plays a large part in the treatment of the disease and if the workman does not get work he is liable to develop a psychoneurosis of a serious type, employers are recommended to cooperate in finding remedial work. The employer's liability in respect to nystagmus should be covered by insurance. In the case of men severely affected before the age of 30, the medical board should have power to suspend them from the work and in the case of older men to advise them against further work on the coal face.

### PARIS

(From Our Regular Correspondent)

Feb 19, 1938

#### Relation of Adrenal Dysfunction to Gastric Ulcer

At the Dec 17, 1937, meeting of the Société médicale des hôpitaux de Paris, a paper was read by Dr. Hernando in which three cases of pyloroduodenal ulcer were reported in patients who presented evidence of marked adrenal insufficiency. When both adrenals are removed in animals, various lesions of the gastrointestinal mucosa, such as erosions, as well as superficial and deep ulcerations, are observed. These lesions resemble similar conditions in human beings. In experimental work, superficial hemorrhages and erosions are more frequently found than round deep ulcers. These superficial lesions most frequently occur in the pyloric region, but they are also found along the lesser curvature and the pyloroduodenal zone. In patients presenting adrenal lesions, one finds gastric erosions and even ulcerations. The latter are rarely seen clinically because this is equally true of Addison's disease.

Another reason why gastroduodenal ulcers are so seldom seen in this disease of the adrenals is that the majority of the patients suffering from adrenal insufficiency manifest evidence of anachlorhydria at a comparatively early stage, furthermore, an active gastric secretion plays an important part in the etiology of gastric ulcers even though hyperacidity does not exist. All of the reported cases were in males and the symptoms of digestive disturbances appeared early. The disease is slow in development and there was always free hydrochloric acid present even though hyperacidity was rarely found. The author did not believe that adrenal insufficiency was responsible for all gastric and duodenal ulcers, but it would be interesting to study further the relation between the two conditions. It might throw light on the etiology of gastroduodenal ulcers.

In the discussion Dr. Marquès called attention to the studies made by Dr. Reilly of Paris, who found that stimulation of the splanchnic nerve either by toxins or by chemical agents was followed by ecchymoses in the gastrointestinal mucosa, hyperemia of mesenteric lymph nodes and hypertrophy of Peyer's patches. Professor Loeper was of the opinion that the splanchnic nerve was only indirectly responsible for such lesions. Removal of the adrenals causes disappearance of substances having to do with the tonus of the sympathetic system. In closing the discussion, Dr. Hernando emphasized the fact that these gastroduodenal ecchymoses are common and are due to a number of different mechanisms. In addition to disturbances of the nervous system one must remember that humoral changes also are concerned. As examples of the diversity of the mechanisms Dr. Hernando recalled the observation that cinchophen is toxic for the gastric mucosa whereas caffeine stimulates the secretion of hydrochloric acid.

### Inhibitory Action of Sulfanilamide and Analogous Drugs on Spermatogenesis

At the December 17 meeting of the Societe medicale des hopitaux a report of the examination of the spermatic fluid in twenty-three cases of gonorrhea treated with sulfanilamide and analogous preparations was made by Drs A Jaubert and Charles Motz of Paris. The number of spermatozoa was found to be normal in 39.13 per cent of the twenty-three cases, moderately decreased in 30.43 per cent and very much diminished in 30.43 per cent. The motility of the spermatozoa as well as their shape was noticeably changed. This toxic action appears as soon as treatment with these newer preparations is begun and appears to continue. In cases of gonorrhea treated by the older methods the spermatozoa are normal in 89.5 per cent of the cases, moderately decreased in 7.8 per cent, very markedly decreased in 0.4 per cent and show azoospermia in 8.2 per cent. All cases in which complications such as epididymitis, prostatitis and vesiculitis presented were excluded from these observations.

### Election of Dr Peyton Rous as Fellow of Academy of Medicine

At the February 8 meeting of the Academie de medecine of Paris, Dr Peyton Rous of the Rockefeller Institute of New York was unanimously elected a corresponding fellow. This is a well merited recognition of the work of Dr Rous in the experimental production of neoplasms.

### Experimental Study of Reflex Ureteral Action on Intestine

Many years ago, Prof James Israel called attention to a condition which he termed "renal ileus." He had observed a reflex paresis of the intestinal musculature following operations on the upper urinary tract. The clinical picture resembled closely that of an intestinal obstruction. The abdominal distension, emesis and inability to pass flatus were often erroneously diagnosed as ileus. Israel's observations have been confirmed by a number of others. A little later a similar reflex paresis of the intestine was described as a frequent accompaniment of the passage of ureteral calculi. When the pain incident to this condition was accompanied by the symptoms of a reflex intestinal paresis, many cases were diagnosed as appendicitis or intestinal obstruction and operations were performed. Since more exact methods of urologic examination have been employed in doubtful cases, such errors of diagnosis are rarely observed. A paper read at the February 5 meeting of the Societe de biologie of Paris by Dr Bariety and Miss Koehler is of considerable interest in explaining why such a reflex paresis of the intestinal musculature takes place. They made a series of experiments in which the ureters of dogs were stimulated and the effect on the intestine noted. Under ordinary conditions, i. e., when no drugs were employed stimulation of one of the ureters is followed by a lowering of the tonus of the intestine with diminution of the amplitude of the contractions of the musculature. This is soon followed by increased tonus with or without diminution in the force of the contractions. These reactions increase in intensity in proportion to the increase in intensity of stimulation. In dogs to which yohimbine has been given, ureteral stimulation is followed by an increase in the amplitude of the contractions of the intestinal musculature and a transitory elevation of the tonus, and an early lowering of the tonus. In dogs that have been given atropine, there is a temporary rise in the tonus of the intestinal musculature usually without increased contractions. This is followed by a prolonged lowering of the tonus and decrease in the amplitude of the contractions but a decrease in their frequency. In dogs that have been given phystigmine either a lowering of the tonus with subsequent elevation is noted or an immediate rise with a marked lowering of the contractions resembling a spasmodic condition of the intestinal musculature. The intestine in

a normal dog offers more resistance, so far as its tonus and contractions are concerned, to ureteral stimulation than the ureter which has been subjected to the influence of drugs which act on the sympathetic and parasympathetic nervous systems.

These experiments appear to confirm the reflex action on the tonus and contractions of the intestinal musculature of various ureteral conditions observed clinically.

### Dr Edmond L Gros Elected President of American Library

At the annual meeting of the American Library of Paris, held recently, Dr Edmond L Gros, chief of staff of the American Hospital, was elected president for 1938.

### BERLIN

(From Our Regular Correspondent)

Jan 24, 1938

### New Statistical Studies of Cancer Mortality

Dr Haubold, a cancer specialist, has undertaken for the National Health Bureau a comprehensive statistical survey of cancer mortality. (He uses the term "cancer" to denote malignant neoplasms of all kinds.) Repeatedly in the course of his investigations, Haubold found that a steadily increasing absolute number of cancer deaths have been reported in official statistical records of civilized countries and that this apparently greater incidence of the disease has been paralleled by a mounting feeling of apprehension. All sorts of explanations of these disconcerting data have been advanced. However, the search for "the" exogenous cancerigenic factor remains fruitless, apart from the field of occupational neoplasms, wherein it has actually been possible to recognize or isolate several cancerigenic factors. Among the more common interpretations of the increase in absolute numbers of cancer deaths are a shift in the age of the population and improved diagnosis. The author became convinced that recent statistical data on cancer mortality can best be evaluated by comparing it with similar data for a nonconsecutive earlier period, preferably the records of a carefully enumerated population for a period near the turn of the century. Such a comparative study should be based on complete statistics for exactly corresponding age groups and the populations studied should be numerically large. In Switzerland, for example, reliable data have been elicited on this basis. Haubold has used the population of Berlin for a similar study, a study that measures up to the criteria of validity which he himself has suggested. He selected as the most appropriate periods for comparison one prewar decade (1901-1910) and one postwar decade (1923-1932). From his computations of cancer mortality per 10,000 living persons in the various age groups and after due consideration of possible sources of error, the author elicited these facts. Among men in almost all age groups up to the seventieth year, a definite falling off in the number of deaths from cancer is discernible. For example, the cancer mortality of men in the sixth decade of life has declined from 38.6 to 31.3 and among men in the seventh decade from 83.8 to 77.9. Only beyond the seventieth year or, in other words, among senile men is a manifest increase, from 114.3 to 127.5, encountered. A similar trend was observed among women with the exception of those in the fourth decade of life. The rate for women at the latter level rose from 5.3 to 6.1, whereas the rate for men of the same age group remained stationary, 2.5 for both periods studied. Among women in the fifth decade of life the rate sank from 19 to 16.7, for those in the sixth decade from 38 to 34.7 and for those in the seventh decade from 65.4 to 63.6. Among senile women (aged 70 and over) the cancer mortality increased substantially, from 87.3 to 109.9. On the basis of the foregoing figures there seems to be no question at all of an increased incidence of cancer deaths among those age groups under 70 regarded as most imperiled by the

disease, rather a decrease in the death rate is discernible among both sexes (with the exception of women in the fourth decade of life)

Haubold then sought an explanation for the notable postwar increase in deaths from cancer among the aged of both sexes. He found, to his surprise, that in the prewar period "infirmities of age" was listed as an official cause of death three times as frequently as in the records of the postwar period. The author assumed therefore that a reciprocal interrelation was present between the decline in mortality from senile infirmities and the increase in that of cancer. The fact that the trend was identical for the two sexes further strengthened this hypothesis. From intensive comparison of the records, Haubold was able to prove that the formal certification of deaths as due to "infirmities of age" had obscured the true incidence of cancer in persons over 70 to a remarkable extent and that this circumstance constituted a source of statistical error. Furthermore, he found that deaths the cause of which is not mentioned or simply listed as "unknown" in the records, while numerous in the earlier period, are no longer statistically important in the later period. Lastly Haubold investigated the noteworthy increase in cancer mortality among women in the fourth decade of life. He found that in the prewar period studied (1901-1910) the younger women within this group, namely, those from 30 to 32 years of age, outnumbered the older women within the group, whereas in the postwar period studied (1923-1932) the reverse was true, the older women within the group preponderating. On this basis the author concluded that displacement in ages within a group would necessarily be followed by an increase in mortality from cancer.

Dr Haubold summed up his observations thus. The statistics for Berlin plainly reveal that the mortality from cancer has tended since the beginning of the century to remain constant or to decline within several age groups. Deviations from this trend in the age groups over 70 and among women in the fourth decade of life are explicable on the basis of changed conventions of necrology and to a shift in preponderant age levels within an age group. The majority of age groups exhibit a definite decline in cancer mortality, and this is especially evident among women. It is at present impossible to evaluate the influence of successful therapeutics on this favorable trend. But it is obvious that even partially successful therapy may prolong life by several years so that the cancer patient may have attained an older age group before death. Such instances would of course influence the statistics. In any event the individual Berliner is in no greater peril of cancer today than he would have been in former years.

#### Death of Prof Friedrich Moritz

Professor Emeritus Dr Friedrich Moritz, for many years ordinarius in internal medicine at Cologne University, died January 12 at the age of 76. Moritz received intensive training in his particular field as assistant to Ziemssen at Munich, and subsequently he served for ten years as associate professor at the university medical polyclinic there. He then filled the post of ordinarius consecutively at the universities of Greifswald, Giessen and Strasbourg. In 1911 he was called to Cologne. Moritz was swift to sense that the discovery of the roentgen rays portended a revolution in medical technique. This interested him in orthodiagraphy, the technique of which he developed in 1904. This proved to be one of Moritz's major contributions to medicine. In addition he initiated much important progress in the field of internal medicine. For example, in 1886 he devised the test for distinguishing fluids of transudation and exudation, named after him the Moritz reaction. Moritz enjoyed a great reputation in internistic circles and among medical men in general, he was for many years regarded as an authoritative and scholarly clinician.

## AUSTRALIA

(From Our Regular Correspondent)

Jan 19, 1938

### A New (?) System of Orthopedics

About six years ago in North Queensland a woman of strong personality with a flair for showmanship commenced treating long standing cases of infantile paralysis and other orthopedic conditions by a "new" method. Calling herself "Sister Kenny," she soon developed such an intensity of public opinion in her favor that the state government opened a clinic in North Queensland. Her claims were so spectacular that the government subsequently opened an "Elizabeth Kenny Clinic" in Brisbane, to be followed later by clinics in Sydney and Melbourne. Her fame became international and cripples came full of hope from South Africa, England and even America. A clinic was opened in London. Twelve months ago she published a textbook of her method, "Infantile Paralysis and Cerebral Diplegia," and she induced the dean of the Faculty of Medicine in the University of Queensland to write the introduction. The general attitude of the medical profession toward her has been wisely tolerant. The danger of martyrdom, in view of the strong public opinion in her favor, was a real danger. The best medical summary of her book was that "there was much in her book that was both good and new. Unfortunately that which was good was not new, and that which was new was not good."

At Elizabeth Kenny's request, the Queensland state government appointed in Brisbane in October 1935 a royal commission to inquire into her method. The members were selected by herself. The report has just been published. It is a fair report and was based on an enormous volume of honorary work on the part of the members. The striking feature of the report was that the Elizabeth Kenny method of treatment of infantile paralysis now differs essentially from orthodox treatment in only two points: the early movement of the limb during the stage of muscle tenderness, and the refusal to accept the principle of supporting every paralyzed muscle by suitable splinting. The terms of reference of the commission were to investigate the modern methods of treatment of infantile paralysis and other diseases of a paralytic nature and to investigate in particular the Elizabeth Kenny method of treating infantile paralysis, spastic paralysis and birth palsy, and to compare the results of this method with the results of orthodox treatment. The report stated that for some years Miss Kenny has been practicing in Queensland a method devised by herself for treatment of paralysis and has roused both public opinion and medical interest with her optimistic claims of cure. Her method, originally unorthodox, approaches now more nearly to orthodox procedure and is outlined in her textbook "Infantile Paralysis and Cerebral Diplegia."

Miss Kenny lays down five principles in treatment: (1) maintenance of a bright mental outlook, (2) maintenance of impulse, (3) hydrotherapy and remedial work, (4) maintenance of circulation, (5) avoidance of the generally accepted methods of immobilization. The Kenny clinics are designed to develop (1) to the greatest possible extent a psychologic outlook formative of both faith and hope. Miss Kenny, herself energetic and enthusiastic, is unstinting with positive statements of promised cure. Government funds to the tune of about £25,000 have been freely used to provide an admirable and inspiring machinery for the carrying out of the method—porcelain baths, colorful appointments, uniformed trainees, free transport and so on. Communal treatment and the intercourse of patients and friends in a cheery and optimistic atmosphere all help to maintain this psychologic outlook. In commenting the commission states that "by maintenance of impulse Miss Kenny apparently means the maintenance of the nervous impulse to the muscles from the brain centers. Miss Kenny and her staff ask the patients



to visualize the part to be moved. This, of course, is of no use for very young patients.

In the use of hydrotherapy the commission concurs, with reservations, stating that as routine practice it is entirely unnecessary in many cases and would add much to the time and cost of treatment. Miss Kenny lays great stress on the individual bath as against pool bathing.

The maintenance of a good circulation, stressed in the Kenny method, is recognized as essential in orthodox treatment, although Miss Kenny would suggest that modern methods of treatment are detrimental to the circulation. She considers that immobilization reduces the vitality of the circulation to such an extent that it should be abandoned. The commission contends that in properly applied shell casts or in splints or frames the circulation is not impaired. These four principles, then, in their major points are in line with orthodox treatment.

The fifth principle is revolutionary and, in the opinion of the commission, a retrograde step. Miss Kenny holds that there are physical, psychologic and physiologic reasons against immobilization, but neither her arguments nor the results achieved by her method were sufficient to induce the commission to concede that immobilization should be abandoned. Without the application of some apparatus to support weak against normal muscles, deformities due to stretching and contracture are expected. Under the Kenny method such deformities have been observed not as frequently as might have been thought. This is due, probably, to the frequency with which the daily joint movements are performed, which frequency of movement would be impracticable in orthopedic departments of most general public hospitals. Also, even such frequent attention would not prevent the development of severe deformities in spinal and abdominal pareses if splinting was abandoned. Again also the Kenny method, by its avoidance of splinting, would encourage more deformities than orthodox methods in those cases in which the condition has not been cured when it is necessary for the patient to leave the clinic.

One other essential difference of Miss Kenny's method is her treatment of acute cases. Whereas an orthopedic surgeon does not commence joint movement until all pain and tenderness have disappeared, Miss Kenny puts all joints through some range of movement at least once a day in the stage of tenderness. Here the commission stresses the point that muscle damage is only secondary to that caused by the virus at the real sites of the disease (in the nervous tissue) and that early treatment of the muscles cannot possibly minimize the actual paralysis.

The exercises described for training of individual muscles and of muscle groups are very much the same as those used in orthodox practice. The commission draws attention to one fault in Miss Kenny's book: viz. there is no instruction to avoid lengthening of weak muscle fibers. The Kenny method involves the use of hot and cold sprays intended to improve the circulation in affected limbs. This is beneficial in the same way as radiant heat, diathermy and massage. The commission commends the use in orthodox practice of certain of Miss Kenny's apparatus—her pulleys for treatment of spinal curvature and extensor pareses and her apparatus for measuring power of thrust in the lower limbs. With regard to treatment of spastic paralysis Miss Kenny's method differs little from orthodox methods. Her patients, however, have had the advantage of more intensive and regular reeducation than is generally possible in clinics of public hospitals and therefore would be expected to have shown greater improvement than most such cases do. Given similar facilities for all patients no difference in results could be expected. In connection with birth palsy all references to the reeducative treatment of poliomyelitis apply exactly to that of birth palsy, with even more stress on the necessity of proper splinting.

Miss Kenny has certainly had some measure of success, but it is considered that this is due to the intensity rather than to

the nature of the treatment. She has been liberally supplied with funds and the commission considers that, given the same intensity of treatment orthodox methods would produce better results. Also Miss Kenny's strong personality and her own conviction of technical competence have led many people, in spite of facts to the contrary, to believe in the possibility of cure or improvement.

Much publicity has been given to the whole subject in the daily press, and Miss Kenny must be given credit for having drawn attention to the subject of crippled children and for her effort to secure organized treatment of cripples. On the other hand, it is felt that an exaggerated status has been given to infantile paralysis by popular opinion and that there are many other types of cripples, equally deserving of government help and care, who may derive greater and more permanent benefit from an equal expenditure of public money.

### The Australasian College of Physicians

The natural development of the Association of Physicians of Australasia, a private but enthusiastically conducted society with restricted membership, is the basis of the formation of an Australasian College of Physicians, the legal incorporation of which is now in its final stages. The college headquarters will be situated in Sydney, and a property has been acquired in Macquarie Street in the medical quarter of the city. The college will be an examining body and will provide a uniform higher qualification in medicine for practitioners in Australia and New Zealand. At the present time the requirements for doctorates in medicine in the Universities of Australia and New Zealand are by no means uniform and there seems to be little chance of obtaining uniformity. With the time not far distant when every member of the staff of a large hospital will be required to have a higher qualification in the special branch of medicine that he proposes to practice, the college not only will act as a stimulus for the attainment of higher degrees but will indirectly raise the standard of the practice of internal medicine, particularly in institutions. It is anticipated that the college will carry on the tradition of the Association of Physicians in the advancement of internal medicine and the promotion of friendship among physicians.

### Sir Frederick Truby King

With the death in New Zealand of Sir Frederick Truby King, one of the greatest figures in the history of child welfare passes. Inspired by the falling birth rate and appalling infant mortality, the child welfare movement had its beginnings in France in the last decade of the last century. America and England followed suit, but it was not till 1905 that any regular inspection of babies and advice to mothers was instituted. On the other side of the world in New Zealand, Dr Truby King was independently developing a scheme for the care and feeding of babies which was to revolutionize infant life in that country, so that its statistics have for some years now been a challenge to the whole world. Local interest in the truly remarkable work of Sir Truby King was so great that Mr Harris offered his own home "Karitane" in Dunedin as a home for the care and treatment of babies and the training of nurses in the Truby King system. In 1907 under the patronage of Lady Plunkett, wife of the governor of New Zealand the Plunkett system of training nurses was inaugurated and from this small beginning has grown a world wide movement and Karitane, Dunedin, became the Mecca of nurses wishing to study maternal and infant welfare.

It was in the control of gastro enteritis that Sir Truby achieved his most signal success. In Dunedin the death rate from infantile diarrhea dropped from 25 per thousand in 1907 to less than 1 per thousand in 1922. Over the same period the tally in Christchurch was reduced from 45 to 2. It has been argued that New Zealand enjoys some special immunity owing to some unusual geographic and climatic conditions. The main



contention is that an equable and moderate temperature operates in favor of the dominion, but this theory is given pause by the fact that the death rate among young children is and has been lower in tropical Queensland than in Tasmania. Sir Truby King was the pioneer of the syndicated health bulletin. At regular intervals he caused to be published in every newspaper of the dominion a simple talk on wise ways in mothercraft.

Born at New Plymouth, New Zealand, Frederick Truby King took the degrees of MB and BSc at Edinburgh University, where he was an Eccles scholar. He was director of child welfare for New Zealand from 1921 to 1927 and Inspector General of Mental Hospitals and a member of the Prisons Board from 1925 to 1927. He founded the Royal New Zealand Society for the Health of Women and Children, known as the Plunket Society, in 1907, and later was lent by the New Zealand government to organize a babies' hospital and mothers' center in England. Sir Frederick's first interest in baby welfare was developed through his successful work among dairy calves on the thousand acre farm belonging to the Mental Hospital, of which he was then superintendent. There he instituted a system of "rational, scientific, artificial feeding" for the calves, based on the percentage composition (and especially the protein ratio) of average cow's milk. As a result of this perfected feeding, mortality from "scouring" among the calves was completely eliminated. The applications of the same principles of percentage feeding to babies reduced mortality from diarrhea to almost nothing in New Zealand. For three successive years not one baby up to the age of 2 years died from any form of this disease in Dunedin, the home of the first Karitane Home. So impressed was Dr. King with the results of his experiments with calves that when a distressed mother brought her baby to him he agreed to take the child into his own home and treat it on the same principles that had proved so successful with calves, taking human milk as his model instead of cow's milk. He and Lady King looked after the baby themselves and it thrived so remarkably that they were soon caring for other undernourished babies. Their fame spread and they were forced to take a cottage near by to accommodate the numbers of babies applying for admission to their care. Lady King could not cope with the work involved, but it was impossible in those days to obtain the services of trained nurses easily, and the help of untrained women had to be employed, often with disastrous results. Sir Frederick's work was recognized by a CMG in 1917 and a knighthood in 1925. But surpassing both these is the international scientific recognition of his work and the fact that his name is a household word in Australasia.

## Marriages

WILLIAM DEAN MOHLENBROCK, Murphysboro Ill, to Miss Katherine Louise Weinberg of DuQuoin, Dec 18 1937

MAE KNOWLES MOULDER, Nashville, Tenn., to Miss Frances Cooley Bell at Rockville, Md, January 1

JOHN JOSEPH CHELEDEN, Philadelphia, to Miss Mary Mercur Roberts of Southampton, Pa, January 18

DAVID H. MORTON, to Miss Dorothy Lucille Young both of Elmwood, Ill, in Peoria, Dec 23 1937

BEN HAGAN MARSHALL, Fayetteville Tenn, to Miss Mary Sue Cooper of Cadiz Ky, Dec 22 1937

JOHN WESLEY PLOWMAN, to Miss Jane E. Moore, both of Harrisburg Pa, January 15

OTTO I. LIBENER, Hazleton Pa, to Miss Eleanor M. Rullo of Philadelphia Nov 10 1937

JOSEPH HERMAN MEADOWS, Fairmont N. C., to Miss Leora Mae Compton Dec 21 1937

JACOB L. FRITZ to Miss Catherine Cranford both of Ashboro, N. C. January 16

ROBERT EDWARD POT to Miss Selma Ander on both of New York, January 12

## Deaths

Edmund Dougan Clark @ Indianapolis, Bellevue Hospital Medical College, New York, 1891, member of the House of Delegates of the American Medical Association in 1907, secretary and professor of surgery, Indiana University School of Medicine, past president of the Indiana State Medical Association, Indianapolis Medical Society and the Marion County Medical Society, member of the American Surgical Association, Southern Surgical Association and the Western Surgical Association, fellow of the American College of Surgeons, served during the World War, consulting surgeon to the Indianapolis City Hospital, on the staffs of the Coleman Hospital for Women, Robert W. Long and Methodist hospitals and the James Whitcomb Riley Hospital for Children, aged 68, died, February 16, of pneumonia.

George Murray Waters @ Columbus, Ohio, Bellevue Hospital Medical College, New York, 1881, professor of physiology and physiological anatomy, Columbus Medical College, 1883-1890, professor of principles and practice of medicine and nervous diseases, Ohio Medical University, 1893-1907, and dean 1896-1907, professor of principles and practice of medicine and nervous diseases and dean, Starling-Ohio Medical College, 1908-1909, on the staff of the White Cross Hospital, aged 58, died, January 22, of pneumonia.

Thomas Barnes Fitcher @ Baltimore, University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1893, associate professor of medicine, Johns Hopkins University School of Medicine, member and past president of the Association of American Physicians, fellow of the American College of Physicians, served during the World War on the staff of the Johns Hopkins Hospital and the Johns Hopkins Dispensary, aged 66, died suddenly, February 25, of coronary occlusion and arteriosclerosis.

Raleigh Russell Huggins @ Pittsburgh, Miami Medical College, Cincinnati, 1891, dean and professor of gynecology at the University of Pittsburgh School of Medicine, member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Gynecological Society, fellow of the American College of Surgeons, medical director of the Elizabeth Steel Magee Hospital and on the staff of St. Francis Hospital, aged 67, died, February 20, of cerebral hemorrhage.

Frank William Porterfield, Waterloo, Iowa, Chicago Medical College, 1879, member of the Iowa State Medical Society, fellow of the American College of Surgeons, on the staffs of the Allen Memorial St. Francis and Presbyterian hospitals, division surgeon to the Illinois Central Railroad, examining surgeon to the United States Compensation Bureau, aged 75, died, Dec 21, 1937, in the Illinois Central Hospital, Chicago, of pneumonia, following uremia.

John T. Rogers @ St. Paul, University of Minnesota College of Medicine and Surgery, Minneapolis 1891, associate professor of surgery at the University of Minnesota Graduate School of Medicine, Minneapolis, fellow of the American College of Surgeons, past president of the Minnesota State Medical Association and the Ramsey County Medical Society, chief and president of the staff of the Charles T. Miller Hospital, aged 70, died, January 2.

Louis Clausen Schroeder @ New York, Columbia University College of Physicians and Surgeons, New York 1911, assistant professor of clinical pediatrics at the Cornell University Medical College, member of the American Pediatric Society and the American Academy of Pediatrics, aged 56, attending pediatrician to the New York Hospital, where he died February 25, of hypertensive vascular disease and arteriosclerosis.

Frank Bradley Cross @ Cincinnati, Miami Medical College, Cincinnati, 1895, formerly secretary and assistant professor of ophthalmology at the University of Cincinnati College of Medicine, fellow of the American College of Surgeons, on the staff of the Cincinnati General Hospital, medical director of the Columbia Life Insurance Company, associate editor of the *Journal of Medicine*, aged 66, died, February 7.

James Farquharson Leys @ Medical Director, Vice Admiral U. S. Navy, retired, Bryn Mawr Pa. University of Pennsylvania Department of Medicine, Philadelphia 1890, entered the navy in 1893 and retired in 1932, served during the Spanish-American and World wars, fellow of the American College of Surgeons, aged 70, died, January 12, in the U. S. Naval Hospital, Philadelphia, of pneumonia.

Julius Heyward Taylor, Columbia S. C. University of Virginia Department of Medicine, Charlottesville 1901, past president of the South Carolina Medical Association, in Miller

and formerly treasurer of the Southern Surgical Association, at one time member of the state board of medical examiners, fellow of the American College of Surgeons surgeon to the Columbia and Baptist hospitals, aged 60, died, January 31

**George Leslie Strader** • Cheyenne, Wyo., University of Nebraska College of Medicine, Omaha, 1899, in 1908 member of the House of Delegates of the American Medical Association, member of the American Academy of Ophthalmology and Oto Laryngology, fellow of the American College of Surgeons, on the staff of the Memorial Hospital, aged 67, died, January 21, in Claremont, Calif., of cerebral hemorrhage

**Thomas Cook Smith** • Louisville, Ky. Johns Hopkins University School of Medicine, Baltimore 1922, associate clinical professor of pediatrics, University of Louisville School of Medicine, member of the American Academy of Pediatrics, fellow of the American College of Physicians, on the staff of the Norton Memorial Infirmary, aged 41, died, Dec 14, 1937, in St Joseph Infirmary

**Edward Everett Evans** • Chicago, Detroit College of Medicine 1900, past president and secretary of the Lake County (Ind.) Medical Society, formerly on the staffs of the Mercy and Methodist hospitals, Gary, Ind., at one time coroner of Lake County, Ind., aged 62, died, Dec 5, 1937, of carcinoma of the prostate, metastatic spinal carcinomatosis, urinary retention and sepsis

**Charles Morton Smith** • Boston, Harvard University Medical School, Boston, 1894, clinical professor of syphilology emeritus at his alma mater and at the graduate school, member and past president of the American Dermatological Association, member of the New England Dermatological Society, aged 70, died suddenly, January 8, of coronary thrombosis

**Anatole Raoul Trahan** • Lafayette, La., Tulane University of Louisiana Medical Department, New Orleans, 1892 past president of the Lafayette Parish Medical Society, served during the World War, at one time mayor and parish coroner, on the staff of St John Hospital aged 67, died, Dec 2, 1937, of cerebral hemorrhage and arterial hypertension

**Walter Richard Wallace**, Memphis, Tenn., College of Physicians and Surgeons, Memphis, 1908, member of the Tennessee State Medical Association, formerly assistant professor of psychiatry at the University of Tennessee College of Medicine, part owner and president of the Wallace Sanitarium, aged 58, died, Dec 13, 1937, of coronary thrombosis

**J William Scales** • Pine Bluff, Ark., Vanderbilt University School of Medicine, Nashville, Tenn., 1888, member of the American Academy of Ophthalmology and Oto Laryngology, fellow of the American College of Surgeons, served during the World War, aged 73, died, Dec 4, 1937, of coronary thrombosis

**Stephen Earle Vosburgh** • Pownal, Maine, Jefferson Medical College of Philadelphia, 1905, member of the American Psychiatric Association and the New England Society of Psychiatry, medical superintendent of the Pownal State School, aged 56, died, Dec 24, 1937, of coronary occlusion

**James Robert Vann**, Abbeville, Ala. Medical College of Alabama Mobile 1899, member of the Medical Association of the State of Alabama, formerly member of the state legislature aged 66, died, Dec 16, 1937, in a hospital at Dothan, of acute cystitis diabetes mellitus and pyelonephritis

**Norman Philip Geis**, Riverside, Conn., Long Island College Hospital, Brooklyn 1896 formerly lecturer in anatomy and instructor of obstetrics and gynecology at his alma mater, at one time on the staff of the Swedish Hospital, Brooklyn, aged 63, died, February 5, in New York

**Paul Russell Stetson**, New Haven, Conn. Yale University School of Medicine, New Haven, 1902, member of the Connecticut State Medical Society, on the staff of the Grace Hospital, aged 59, died, Dec 7 1937, of cerebral accident from hypertension and edema of the lungs

**John Schee** • Westby, Wis., University of Michigan Department of Medicine and Surgery Ann Arbor, 1892 at various times county health officer, member of the Westby school board and county board of education aged 75, died Dec 16 1937, of coronary occlusion

**Joseph Seymour Tennen** • Stamford, Conn., University and Bellevue Hospital Medical College New York, 1920 member of the Radiological Society of North America aged 43, died Dec 12, 1937, in the University Hospital, Ann Arbor, Mich. of coronary occlusion

**Albert John Pullen** • Fond du Lac, Wis., University of the South Medical Department Sewanee Tenn. 1898, formerly state senator served during the World War at one time bank president aged 74, died, Dec 6, 1937, in St Agnes Hospital, of coronary occlusion

**Forrest Wiley Pike**, Stoneham, Mass., University of Vermont College of Medicine, Burlington 1890, member of the Massachusetts Medical Society, aged 75, died, Dec 31, 1937 in the New England Sanitarium and Hospital, Melrose, of cerebral hemorrhage

**Loyal Wilbur Wilson** • New Castle, Pa., Western Pennsylvania Medical College, Pittsburgh, 1891, fellow of the American College of Surgeons, on the staff of the Jameson Memorial Hospital, aged 71, died, Dec 27, 1937, of coronary thrombosis

**Christen Quevli Sr**, Tacoma, Wash., Minnesota Hospital College, Minneapolis, 1885, past president and vice president of the state tuberculosis association, served during the World War, aged 73, died, Dec 1, 1937, in Seattle, of lobar pneumonia

**Floyd G Rifenberg**, Gaylord, Mich., Detroit College of Medicine and Surgery, 1928, member of the Michigan State Medical Society, served during the World War, aged 41, died, Dec 19, 1937, in the Mercy Hospital, Grayling, of heart disease

**Frank W Milward** • Lakewood, Ohio, Tufts College Medical School, Boston, 1919, fellow of the American College of Surgeons formerly on the staff of St John's Hospital, Cleveland, aged 45, died suddenly, Dec 25, 1937, in Rocky River

**Wellington Clarence Van Wormer**, Homewood, Ill., St Louis University School of Medicine, 1910, member of the state department of health, aged 51, died, Dec 13, 1937, in the Ingalls Memorial Hospital, Harvey, of cardiovascular renal disease

**Howard Alfred Baynton**, Bradford, Pa., Northwestern University Medical School, Chicago, 1931, member of the Medical Society of the State of Pennsylvania, aged 32, on the staff of the Bradford Hospital, where he died, Nov 15, 1937

**Willis P Weaver**, Lockport, N Y., Hahnemann Medical College of Philadelphia, 1883, member of the Medical Society of the State of New York, aged 84, died, Dec 26, 1937, of carcinoma of the bladder and pulmonary embolism

**William Essex Whitson** • Washington, D C., Columbian University Medical Department, Washington 1898, served during the World War, aged 63, died, Dec 3, 1937, in the George Washington University Hospital, of heart disease

**Charles Henry Robinson**, Columbus, Ohio Hahnemann Medical College and Hospital of Philadelphia, 1937, aged 27 intern at the White Cross Hospital, where he died, Dec 10, 1937, of cerebrospinal meningitis and pneumonia

**Herbert Eugene Rowe**, Newton, N C., North Carolina Medical College, Davidson, 1905 served during the World War aged 55, died, Dec 11, 1937, in a hospital at Statesville, of injuries received in an automobile accident

**Joseph S Niederkorn**, Versailles, Ohio, Eclectic Medical Institute, Cincinnati 1887, member of the Ohio State Medical Association, formerly mayor of Versailles, aged 71, died suddenly, Dec 28 1937, of coronary thrombosis

**Edwin A Sevringhaus**, New Albany Ind., Louisville (Ky.) Medical College, 1890, Hahnemann Medical College and Hospital of Philadelphia, 1891, aged 69, died, Dec 13, 1937, in St Edwards Hospital, of cerebral hemorrhage

**Ernest Miller Swift Jr**, Louisville, Ky., University of Louisville School of Medicine, 1937, intern at the Kentucky Baptist Hospital, aged 25, died, Dec 8, 1937, in the City Hospital, of Streptococcus viridans infection

**John Henry Eugene Sand**, Brooklyn, University of the City of New York Medical Department, 1886, aged 76 died Dec 2, 1937, in the Nathan Littauer Hospital, Gloversville, of angina pectoris and chronic myocarditis

**Carl Gustav Larson**, Medford, Mass., College of Physicians and Surgeons, Boston, 1927 member of the Massachusetts Medical Society, aged 42 died, Dec 23, 1937, of heart disease and acute pulmonary edema

**Leonard C Schulze** • Chicago Dearborn Medical College Chicago 1905 aged 65 member of the board of directors and on the staff of the Garfield Hospital, where he died, Dec 12, 1937, of aneurysm of the aorta

**Henry Landalynn Trenkle** • Portville, N Y., Minneapolis College of Physicians and Surgeons, 1909, member of the American Psychiatric Association, aged 63, died, Dec 4, 1937, of carcinoma of the esophagus

**T C Gaboury**, Montreal, Que., Canada School of Medicine and Surgery, Montreal 1873 formerly member of the legislature of Quebec and mayor of Brvson, aged 86, died, Dec 28, 1937 of pneumonia

**Francis Theodore Rollins** • Fox Lake Ill. Chicago College of Medicine and Surgery, 1916, served during the World War aged 53 died, Dec 22, 1937, at St Therese's Hospital, Waukegan of pneumonia

**Edward R. Roderick**, Wilkes-Barre, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1895, aged 65, died, Dec 21, 1937, in the Wilkes-Barre General Hospital, of intestinal obstruction

**William Golford Robertson**, Warren, Pa., University of Buffalo School of Medicine, 1935, member of the Medical Society of the State of Pennsylvania, aged 30, died, Dec 27, 1937, of cerebral emboli

**Henry Schmid**, New York, University of the City of New York Medical Department, New York, 1895, aged 80, died, Dec 19, 1937, in Baldwin, N. Y., of injuries received when struck by a motorcycle

**Virgil Morrison**, Atchison, Kan., Ensworth Medical College St. Joseph, Mo., 1905, member of the Kansas Medical Society, aged 55, died, Dec 17, 1937, in Los Angeles, of arteriosclerotic heart disease

**John H. Gerhardt**, Sunbury, Ohio, Columbus Medical College, 1882, member of the Ohio State Medical Association, member of the county board of health, aged 79, died, Dec 30, 1937, of heart disease

**Charles E. F. Streutker** \* St. Louis, Missouri Medical College, St. Louis, 1895, on the staff of the Alexian Brothers' Hospital, aged 64, died, Dec 29, 1937, in St. Anthony's Hospital, of pneumonia

**Julius E. Sommerfield** \* Atlanta, Ga., Medical College of Ohio Cincinnati, 1886, on the staffs of the Piedmont Hospital and Grady Hospital, aged 72, died, Dec 14, 1937, of coronary thrombosis

**Millard Fillmore Thompson** \* Washington, D. C., Columbian University Medical Department, Washington, 1884, aged 80, died, Dec 26, 1937, of arterial hypertension and chronic nephritis

**David Lafayette Snyder**, Philadelphia, Hahnemann Medical College of Philadelphia, 1878, aged 81, died, Dec 31, 1937, of cardiac decompensation, pulmonary edema and chronic myocarditis

**James Stephen H. Potter**, Baltimore, Eclectic Medical Institute, Cincinnati, 1894, Pulte Medical College, Cincinnati, 1895, aged 69, died, Dec 28, 1937, of carcinoma of the prostate

**Frank N. Saville**, Springfield, Mo., Nebraska College of Medicine, Lincoln, 1909, member of the Missouri State Medical Association, aged 62, died, Dec 12, 1937, of pernicious anemia

**Ralph Allen Wilcox** \* Phoenix, N. Y., Syracuse University College of Medicine, 1899, aged 63, drowned, Dec 7, 1937, when his car plunged over an embankment into the river

**Charles Albert Reger**, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1886, aged 75, died, Dec 17, 1937, of chronic myocarditis and prostatic hypertrophy

**Samuel H. Woods**, Winter Haven, Fla., University Medical College of Kansas City, Mo., 1895, also a pharmacist, aged 75, died Dec 27, 1937, of an injury received in a fall

**William Isidore Wallach**, New Rochelle, N. Y., Cornell University Medical College, New York, 1906, aged 55, died, Dec 30, 1937, of arteriosclerosis and coronary occlusion

**Grant L. Taylor**, Mount Vernon Ill., Barnes Medical College St. Louis, 1895, county coroner, aged 69, died, Dec 28, 1937, of pneumonia, due to an injury received in a fall

**Wilber Maurice Swett**, San Francisco, Cooper Medical College, San Francisco 1892, aged 71, was killed, Dec 26, 1937, when his automobile went over an embankment

**Theodore Miles Wittkamp**, Cincinnati, Medical College of Ohio Cincinnati, 1902, aged 59, died Dec 19, 1937, in the Jewish Hospital, of arteriosclerosis and hypertension

**Peter Stevens Smigel** \* Cleveland Western Reserve University Medical Department, Cleveland, 1894, aged 65, died, Dec 2, 1937, in Independence Ohio, of carcinoma

**Jacob Lorenz**, Pittsburgh, Western Pennsylvania Medical College Pittsburgh, 1894, aged 68, died, Dec 19, 1937, of carcinoma of the liver and hypostatic pneumonia

**Edward W. Parker**, Pasadena Calif., College of Physicians and Surgeons, Keokuk Iowa, 1876 Civil War veteran, aged 92, died Dec 26, 1937, of cerebral thrombosis

**John Perkins Russell**, Springfield Mass. (licensed in Massachusetts under the Act of 1894) aged 86, died, Dec 19, 1937, in the Springfield Hospital, of heart disease

**Henry Arthur Stone**, Philadelphia, Temple University School of Medicine Philadelphia 1921, also a dentist, aged 42, died Dec 22, 1937, of multiple sclerosis

**Charles Austin Willett**, Norwalk Iowa, Drake University Medical Department Des Moines, 1902, aged 61, died, Dec 29, 1937, probably of coronary thrombosis

**Hugh Tamisiea**, Missouri Valley, Iowa, State University of Iowa College of Medicine, Iowa City, 1902, aged 61, died, Dec 18, 1937, of coronary thrombosis

**John F. Pearce**, Albuquerque, N. M., Jefferson Medical College of Philadelphia, 1883, aged 77, died Dec 13, 1937, of heart disease and chronic nephritis

**Rupert Lyle Turrell**, Cleveland, University of the City of New York Medical Department, 1892, aged 73, died, Dec 19, 1937, of carcinoma of the bladder

**John Andrew B. Word**, Clarksville, Tenn., University of the City of New York Medical Department, 1891, aged 75, died, Dec 15, 1937, of pneumonia

**William M. Allison**, Conway, Ark., St. Louis Eclectic Medical College, 1876, Civil War veteran, aged 96, died, Dec 19, 1937, of hypostatic pneumonia

**Thomas Joseph Ryan**, New York, Fordham University School of Medicine, New York, 1914, aged 51, died, Dec 17, 1937, of carcinoma of the colon

**Emerson Carter**, Brimhurst, Ind., Physio Medical College of Indiana, Indianapolis, 1909, aged 53, was killed, Dec 29, 1937, when struck by a train

**John T. Cass**, Fitzgerald, Ga., University of the City of New York Medical Department, 1887, aged 86, died, Dec 8, 1937, of cerebral hemorrhage

**Donovan Penheiter**, Bagley, Minn., Northwestern University Medical School, Chicago, 1937, aged 26, died, Nov 27, 1937, of cerebral hemorrhage

**Franklin Gordon**, Morrilton, Ark., Louisville (Ky.) Medical College, 1874, Confederate veteran, formerly postmaster, aged 84, died, Nov 30, 1937

**Frank Lee Klopfenstein** \* Toledo, Ohio, Toledo Medical College, 1910, aged 66, died, Dec 13, 1937, of coronary thrombosis and arteriosclerosis

**Richard Hutchins Whelpley**, New York, Cornell University Medical College, New York, 1937, aged 27, died, Dec 9, 1937, in a local hospital

**Frank Howard Stewart**, Kimball, S. D., Sioux City (Iowa) College of Medicine, 1902, aged 61, died, Dec 2, 1937, of coronary thrombosis

**William J. Rouse**, Ambler, Pa., College of Medicine and Surgery, Chicago, 1900, aged 67, died, Dec 19, 1937, of cirrhosis of the liver

**Elmer Ellsworth Robbins**, New Bedford, Mass., Baltimore Medical College, 1896, aged 76, died, Dec 21, 1937, of bronchopneumonia

**Catherine Vickers**, Cleveland, Ohio Medical University, Columbus, 1898, aged 74, died, Nov 24, 1937, at Bay Village, of heart disease

**Shelby D. Winstead**, Rineyville, Ky., University of Louisville Medical Department, 1891, aged 71, died, Dec 23, 1937, of heart disease

**Jacob Sylvanus Rinehart**, Flora, Ind., Eclectic Medical Institute Cincinnati, 1903, aged 58, died, Dec 2, 1937, of pernicious anemia

**William Speer Stone**, Benton Ky., University of Louisville Medical Department, 1888, aged 75, died, Dec 2, 1937, of myocarditis

**Norman Joseph Kilbourne** \* Los Angeles Rush Medical College, Chicago, 1924, aged 47, died, January 16, of coronary thrombosis

**Fred Bacharach**, Los Angeles, Medical College of Ohio, Cincinnati, 1886, aged 72, died, Nov 3, 1937, of coronary sclerosis

**Richard M. Southard**, Fort Smith Ark., University of Louisville (Ky.) Medical Department, 1887, aged 72, died, Nov 2, 1937

**Jacob Wilson Seip**, Erie Pa., Jefferson Medical College of Philadelphia 1883, aged 77, died, Dec 28, 1937, of myocarditis

**James John Rose**, Marshall, Ill., Chicago Homeopathic Medical College 1896, aged 74, died, Dec 16, 1937, of pneumonia

**James Lester Wright**, Yantis, Texas, Memphis (Tenn.) Hospital Medical College, 1905, aged 60, died Nov 18, 1937

**Guy Harold Sumrell**, Ayden, N. C., Medical College of Virginia Richmond, 1915, aged 45, died, Nov 20, 1937

**George B. Broadway**, Delhi, La., Chattanooga (Tenn.) Medical College 1901, aged 60, died, Dec 2, 1937

**David S. Neer**, Vinita, Okla., Albany (N. Y.) Medical College 1875, aged 85, died, Nov 14, 1937

## Correspondence

### ACTION ON RAPPEYE PROPOSAL

*To the Editor*—In an editorial in *THE JOURNAL*, February 26, page 654 it is stated that "the executive body of the Association of American Medical Colleges promptly expressed its approval of the measure in a special session and endeavors were made to obtain endorsement from the Federation of State Medical Licensing Boards and other bodies in convention at the same time as the Annual Congress on Medical Education and Licensure." This is a misstatement.

The executive council of this association did meet in a regular session. Dr. Rappeye's proposal was not discussed or even mentioned. The council was not aware that Dr. Rappeye intended to make his proposal. Therefore, it was not possible to express approval or disapproval.

As had been done in 1937, the president of the association called a conference of representatives of various organizations interested in medical education for the purpose of discussing problems of mutual interest. At this conference Dr. Rappeye presented his proposal. It was discussed at great length but this group could not take action on any topic discussed, nor could any topic be referred to any of the groups represented at the meeting for future action. True any one present could bring up anything discussed before his organization but without obligation to the conference, which was entirely a voluntary affair and merely a sort of clearing house for free discussion.

FRED C. ZAPFFE, M.D., Chicago

Secretary, Association of American Medical Colleges

### CONVULSIONS DURING INSULIN THERAPY IN THE PSYCHOSES

*To the Editor*—Cameron and Hoskins (*THE JOURNAL*, Oct 16, 1937, p 1246) say "we consider that when convulsions occur treatment should be terminated immediately by means of intravenous sugar." Epileptiform attacks during the course of insulin treatment in schizophrenia have occasioned various reactions among different investigators. Sakel himself stated that he tried to avoid convulsions. Rymer, Benjamin and Ebaugh (*THE JOURNAL*, Oct 16, 1937, p 1249) state that their results indicate that "convulsions did not interfere with good therapeutic results." Wortis (*THE JOURNAL*, Oct 30, 1937, p 1470) writes that "some recognize convulsions as not only harmless but even beneficial." He also points out that although Sakel considers the convulsive reactions as "heavy artillery" and prefers to use "light artillery," nevertheless he recognizes that favorable effects sometimes follow major seizures. On the whole the actual status of convulsive reactions in the treatment is still uncertain.

Successes with the convulsant therapy of Meduna have already led to a more favorable attitude toward insulin seizures. According to Grayzel (*Arch Int Med* 54:694 [Nov.] 1934) similar proconvulsions in rabbits cause cerebral damage. When no convulsions followed insulin injections there were no microscopic histopathologic changes in the brain, after slight convulsions there were minimal or no brain changes, after one or more severe convulsions there were definite anatomic lesions. The greater the number and the more prolonged the convulsions the more severe were the lesions, among other changes there were small zones of focal necrosis in the cerebral cortex. The dose of insulin was comparable to that now used in schizophrenia. Therefore convulsant reactions with insulin should preferably be avoided. What bearing these histopathologic observations have on convulsant therapy with camphor or metrazol can only be a matter of conjecture. The question is worthy of further study.

When convulsions occur in the course of insulin therapy, one wonders whether intravenous injection of dextrose is urgent. During hypoglycemic convulsions, resulting from either insulin injection or spontaneous hyperinsulinism, I have noted, as have many others, that the blood sugar rises to normal levels. In fact the conversion of muscle glycogen into dextrose during a seizure is considered by some investigators to be a homeostatic mechanism. Whether or not the rise in blood sugar is sufficient in all instances to neutralize the effects of the hypoglycemia at the time, or how long the normal blood sugar level, if attained, persists, we cannot say. For these purposes it may, perhaps, still be necessary to supply exogenous dextrose orally but probably not intravenously. Further observation of the post-convulsive rise in blood sugar to determine its frequency, degree and duration is desirable.

EUGENE ZISKIND, M.D., Los Angeles

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### CORRECTION TREATMENT OF CHOREA

In the answer in *Queries and Minor Notes* (*THE JOURNAL*, February 26, p 676) in the second paragraph there is a rather important error with regard to the dosage of the soluble barbital derivatives. The statement "Sodium amytal from 1 to 2 Gm. or pentobarbital sodium from 0.065 to 1 Gm. should be given orally as often as necessary to control the patient" should be corrected to read as follows: "Sodium amytal may be given intramuscularly in doses of 0.13 or 2 Gm. should be corrected to read as follows: Sodium amytal from 1 to 2 grains (0.065 to 0.13 Gm.) or pentobarbital sodium 1 grain (0.065 Gm.) should be given orally as often as is necessary to control the patient. Sodium amytal may be given intramuscularly in doses of 0.13 Gm. (2 grains)." (2 grains)

### EPINEPHRINE IN GENERAL ANESTHESIA—ANESTHESIA FOLLOWING COCAINE LOCALLY

*To the Editor*—Is there any contraindication to the use of epinephrine during chloroform or ether anesthesia? Is general anesthesia contraindicated following the topical administration of cocaine? If so what is the rationale of each? Please give references if possible.

M.D., Louisiana

**ANSWER**—The effect of epinephrine during anesthesia has been studied by many investigators and from many points of view. Experimentally, G. A. Emerson (*Action of Inhalation Anesthetics on Dehydrogenases*, *Current Res Anesth & Analg* 15:134 [May-June] 1936) noted that lactic acid dehydrogenase of brain tissue is not inactivated by the common inhalation anesthetics. The stimulation of epinephrine secretion by the anesthetic may account for the glycogenolytic activity. No inactivation of luciferase of a lampyrid occurs at anesthetic or sublethal concentrations of inhalation anesthetics. A. G. Levy and Thomas Lewis (*Heart Irregularities Resulting from the Inhalation of Low Percentages of Chloroform Vapor and Their Relationship to Ventricular Fibrillation*, *Heart* 3:99, 1911-1912), in experiments on cats, found that "Small intravenous injections of adrenalin chloride produce, under high percentages of chloroform vapor, a condition of irritability in the ventricle, which is similar to that observed to result from low percentages of chloroform alone. Low tensions of chloroform administered to cats together with small intravenous injections of adrenalin chloride ultimately produce the highest grade of ventricular disorder, i.e. ventricular fibrillation." In a later article Levy (*A Cardiac Effect of Adrenalin in Chloroform Subjects*, *Brit M J* 2:627 [Sept 14] 1912) concluded that "it is unsafe to inject adrenalin into the veins or vascular tissues of a patient lightly under the influence of chloroform. It may be safely injected just previous to induction with chloroform—that is, with the patient under no anesthetic at the moment, or in a patient fully under chloroform or into a patient anesthetized to any degree with ether." In 1914 Levy (*Sudden Death Under Light Chloroform Anesthesia*, *Proc Roy Soc Med* 7:57 [Sect Anaesth] 1914) stated that "when the heart is affected by low concentrations of chloroform it is thrown by the action of

adrenalin into a condition known as ventricular fibrillation, but when affected by full concentration such, for instance, as a 2 per cent proportion of vapor to the inhaled air, ventricular fibrillation does not occur.

I have never observed death by ventricular fibrillation in cats under ether even very large doses of adrenalin have failed to produce this effect." Clinical experience bears out Levy's experience. J T Gwathmey (Anesthesia, ed 2, New York, Macmillan Company, 1924, p 373) quoted Delbet, Herrenschmidt and Beauvy (Chloroformisation et capsules surrenales, *Rev de chir* 45 544 [April 10] 1912), who said that "adrenal extracts should be administered to chloroformed subjects, whether the suprarenal capsule shows evidence of weakness or whether it gives evidence of struggle and consequent reaction. The effect of prolonged chloroform administration on the medullary portion of the adrenal is diminution and even disappearance of both chromaffin and adrenalin. Delbet has administered adrenalin to more than 1000 chloroformed patients. The results have been splendid. He believes that adrenalin unquestionably regularizes the narcosis and diminishes (in most cases eliminates) postoperative shock." Douglas (Action protectrice de l'adrenaline, syncope adrenalin-chloroformique, *Compt rend Soc de biol* 91 1419 [Dec 15] 1924) said that intravenous injections of epinephrine during anesthesia produce syncope and death but that injected before chloroform anesthesia epinephrine is innocuous and furthermore offsets the ill effects of an injection of epinephrine given again during anesthesia. It was his opinion that epinephrine produces either a fatal or a protective effect depending on whether it is administered before or during anesthesia. Victor Papilian, Ion Cosma and I G Russu (Recherches experimentales sur la syncope adrenalin-chloroformique, *Compt rend Soc de biol* 115 311 [Nov 23] 1934) found that the administration of from 0.01 to 0.02 mg of epinephrine per kilogram causes syncope in dogs anesthetized with chloroform but not in those anesthetized with ether. Andre and Edith Tournade (De l'influence des anesthésiques [ether et chloralose] sur les effets cardio-vasculaires de certaines excitations nerveuses, *Compt rend Soc de biol* 121 910 [No 9] 1936) reported that ether paralyzes the secretion of epinephrine and also decreases the sensitivity of the cardiovascular system to epinephrine. Chloralose does neither. This explains the difference in the effects of excitation of the vagus and splanchnic nerves on the arterial pressure in the two cases.

The use of a general anesthetic is not contraindicated following the topical administration of cocaine.

#### DERMATOMYCOSIS OR DYSIDROSIS

To the Editor—A white married woman about 50 years old has had blisters occurring on the soles of her feet at irregular intervals for the past five years. These last about two weeks and disappear. Their presence is accompanied by itching, burning and pain which necessitates the avoidance of shoes. The blisters vary in size, the largest being about half or three quarters of an inch long or wide. They occur more often in the summer than in the winter. Synchronously with the blisters which are by far more frequent on the feet than on the hands, there often appear brownish and pinkish papules on the hands (mostly along the outer edge between the dorsal and palmar surfaces) which are pruritic. The past history seems to be rather irrelevant. Is a diagnosis of dermatitis herpetiformis (vesicular or bullous) indicated? If so what is the best form of treatment? If not what would be the correct diagnosis?

SAMUEL BARNAK MD Brighton Beach N Y

ANSWER—There are two conditions answering the description given: (1) dysidrosis, a rare disease supposedly of the sweat apparatus, caused, it is conjectured, by nervous or toxic disturbance of internal origin, and (2) dermatomycosis, ringworm infection, which lurks between the toes unnoticed until it flares up with vesicular eruption on the soles, sides of the feet and between the toes, subsiding usually in a week or two.

The latter is much the commoner and should be examined by maceration of the roofs of the vesicles and the scales from between the toes in 10 per cent sodium hydroxide solution. These are examined with the high dry lens at intervals for seventy-two hours, if a positive result is not obtained in a shorter time. The fungi appear as highly refractive spores or mycelia.

The involvement of the hands occurs in both diseases. In the dermatomycosis it is explained as a trichophytid, an eruption due to toxins transported by the blood or to a higher resistance in the tissues of the hands, enabling them to kill off more readily the organisms deposited from the blood.

If the examination for ringworm gives positive results, one of the best ways of subduing the vesicular eruption is the use of potassium permanganate, either in a 1:3000 solution in water in which the parts are soaked for half an hour twice a day, or a 1 or 2 per cent paint to be applied once a day and allowed to dry. When this causes uncomfortable dryness, a

Whitfield ointment, 5 per cent salicylic acid and 10 per cent benzoic acid in rose water ointment, may be substituted. This should be used daily for about two weeks after the attack has subsided and then applied between the toes once or twice a week after this to prevent recurrence.

The socks should be changed often and boiled or, if of silk, sterilized by chemical means when washed. One may treat the shoes by inserting into each one a piece of blotting paper saturated with strong solution of formaldehyde, wrapping up the shoes as nearly air tight as possible and leaving them for at least a day, and then carefully airing them before using them.

If no fungus is found, the case may be one of the rare dysidrosis. The treatment is local and general. The patient's nervous system is supposed to be at fault, so attention should be directed to correction of any disorder of this kind that can be found. Tonics, interdiction of tea, coffee, tobacco and alcohol, plenty of outdoor exercise between attacks and regularity of habits are recommended. Locally, the use of potassium permanganate as for the preceding disorder is excellent to cut short the attack. Between attacks, sponging the feet with 1 per cent salicylic acid in 50 per cent alcohol after the bath, and plentiful use of a simple dusting powder are helpful.

The diagnosis of dysidrosis cannot be established until a thorough search for fungi has been made. Some authorities doubt the existence of such a disease, considering all these conditions as due to ringworm infection.

Dermatitis herpetiformis is more generalized, the eruption changing its location frequently.

#### DEAF MUTISM OR FEEBLEMINDEDNESS IN GIRL

To the Editor—A girl, aged 8 years of normal delivery has always been well and active. She cannot read or write and cannot or will not cooperate in hearing tests so that it is impossible to determine whether she can hear anything or not. Examinations of the ear, nose and throat give entirely negative results. The eustachian tubes open easily. She has never talked but does call attention to airplanes and can hear in automobile horn a gun shot or a firecracker behind her. Is this child a deaf mute? Is there some way to find out whether she can hear or not? Should she be put in a school for the deaf or should she get individual training in speaking and interpreting sound? MD West Virginia

ANSWER—There are a number of ways of testing a child as to its capacity without the use of language. It must not be forgotten that a child may appear to be deaf, even at the age of 8 years, because the child has found that with a minimum of effort on its part its wants can be attended to. On the other hand, it seems unlikely that, if this child were of normal intelligence, some effort to hear would not have been made by her before the present time. This type of problem is one which calls for the attention of a trained psychologist since the physical examination is negative. It is possible, too, that this child has that peculiar type of deafness described by Ewing, in which the patient is able actually to hear but owing to a defect in certain parts of the tone range the words and meaningful sounds are poorly interpreted. The first thing that should be done with this child before deciding whether she should be put in a school or should get individual training is to give an intelligence test of a performance type which does not require the use of hearing or speech. A local psychologist attached to a mental hygiene clinic could administer such a test. It may be that instead of a school for the deaf this child would require an institution for the feeble-minded. Regardless of that fact, if the psychologist finds her to be of normal intelligence, it calls for special work on the part of the physician and a psychologist who would work out a training program for her, and naturally the greater the experience of the psychologist in this work with deaf children the more useful he will be to the physician.

#### IODIZED OIL IN DIAGNOSIS OF SPINAL TUMORS

To the Editor—I am interested in the technique of the injection of iodized oil for the diagnosis of tumors in the neurocanal its indications, limitations and dangers.

GUY E VAN DENMARK MD Sioux Falls S D

ANSWER—The technique employed for injecting iodized oil is similar to that employed in carrying out a lumbar puncture. The same sort of needle is used and after the spinal pressures have been determined and at least 5 cc of spinal fluid has been withdrawn, a similar quantity of heavy solution of iodized oil is introduced into the spinal canal through the same needle. The iodized oil is usually made up with some heavy oil, therefore it is important to warm the oil to a temperature of about 102 or 103 F but never warmer. It is necessary to have the oil warm so that it will flow, but if it is heated to any greater degree than 102 or 103 F there is danger of irritating the root and giving rise to additional neuritic pain. The indications for

the injection of iodized oil are two (1) to identify a tumor when neurologic examination is not sufficient and (2) to aid in determining the character of the tumor. Extramedullary tumors situated within the canal usually produce filling defects which are readily demonstrated on fluoroscopic examination and frequently demonstrated on x-ray films. As a rule, injections of iodized oil do not seem indicated when the neurologic observations suggest a definite level and a block in the spinal canal. Iodized oil, then, is of extreme value in assisting in the recognition of small tumors which have not produced cord compression, and it is likewise of value in recognizing and locating the so called protruded intervertebral disk which so often is the cause of chronic recurring sciatica. In reply to the question on limitations and dangers, iodized oil should not be used indiscriminately, because it does give rise to a low grade meningitis. There is an increase in the cell count, possibly an increase in the proteins in the spinal fluid, as a result of the injections. However, no detrimental effect is observed. Heavy iodized oil rather than the light is preferred, for an iodized oil lighter than the cerebrospinal fluid will ascend and eventually lodge in the subarachnoid spaces and possibly in the ventricle, whereas the heavy oil has a tendency to rest in the caudal site and in a few instances has been removed. Of course it is usually removed when positive observations are demonstrated and a laminectomy is done, because then the iodized oil can be removed through the same laminectomy wound.

#### DIABETIC COMA WITHOUT GLICOSURIA—REACTIONS TO CALCIUM INJECTIONS

To the Editor—1 Can diabetic coma occur in the absence of glycosuria with hyperglycemia present? 2 I observed two reactions from intravenous injections of 10 cc of 10 per cent calcium gluconate solution in two patients about twenty four hours following the injection. The first patient a woman aged 31 experienced much restlessness nervousness emotional instability excitability and fatigability twenty four hours after the injection which wore off gradually in three days she also had flashes of hot and cold (no thyroid or menstrual disturbances) and a tight feeling in the epigastrium with anorexia. The second patient a woman aged 43 suffered from a severe continuous headache and an eruption twenty four hours after the intravenous injections she describes the eruption as being papular and itchy distributed on the face scalp and buttocks. I did not see the rash. She also had anorexia and heaviness in the epigastrium. This wore off gradually in about six days. Both patients were under treatment for syphilitic colitis and were getting along well. They also had calcium gluconate intramuscularly without a reaction before the intravenous administration of the drug. Is it possible that these reactions were due to the calcium or was it a coincidence? Is there anything in the literature about calcium reactions? Neither had any reaction from the injection until twenty four hours later.

M D New York

ANSWER—1 It is possible that diabetic coma with hyperglycemia without glycosuria may occur in patients with marked impairment of renal function.

2 Delayed reactions in patients receiving calcium gluconate intravenously are rarely or never encountered. If a patient with a normal blood calcium is given calcium intravenously, uncomfortable symptoms may follow until the excess calcium is excreted. However, in the foreign literature several reports of delayed reactions have appeared which were attributed to the injection of calcium gluconate and lactate. M Moschini (*Policlinico* 41 166 [Feb 5] 1934) reports that a patient with pulmonary tuberculosis had nausea vomiting and a chill six hours after the third and fourth intravenous injections of calcium gluconate. After three or four hours these symptoms were followed by prostration marked asthenia and subfebrile temperature. Moschini found that by combining epinephrine or a camphor with the calcium gluconate he avoided a reaction. Alvarez Fernandez (*La Medicina Thera* 21 [July 4] 1936) reports three cases in which chills fever nausea vomiting and malaise followed from one to several hours after the administration of calcium gluconate or lactate.

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#### PSYCHOSIS AND DEATH FOLLOWING TRAUMA IN AGED

To the Editor—A woman aged 65 a widow, apparently healthy, had a contusion of the elbow by a fall on a slippery sidewalk. No fracture or other bone change was detected by fluoroscope or film. There was considerable ecchymosis but no great pain and the arm was placed in a sling. Six days after the injury she had a sudden severe profuse hematemesis and was hospitalized. She had a severe hematemesis twenty four hours later and a slight one forty eight hours after the first. No further hemorrhage occurred although there was a laboratory report of slight blood in the stool several days later. There was extreme anemia. Five days after the hemorrhage she developed an acute psychosis. She was given a transfusion but no improvement occurred. She was fed through a nasal catheter for the next four weeks until she died. She had a high fever the last few days. Necropsy failed to reveal any pathologic changes of note in the stomach esophagus or intestine. A mild gastritis thought to be due to irritation from the tube was present but no scars or ulcers of any kind were found. The liver and spleen were practically normal. How could the hemorrhage be accounted for with a lack of pathologic changes at necropsy four weeks later? What connection if any, could her nervous condition have with the hemorrhage? Can you refer me to literature on this type of case? Could the slight accident have set up the train of symptoms?

M D Nebraska

ANSWER—Psychosis and death from exhaustion not infrequently follow rather trivial injuries in the aged. Rather commonly a fall on the floor at home or a fall on the sidewalk without apparent serious injury will set up a train of psychotic symptoms and terminate in death in just such a manner as described in this case. There are two possible causes, the fall on the sidewalk and the severe hematemesis, both of which probably played a part in precipitating the psychosis.

In view of the blood picture and the results of the necropsy, it seems unlikely that the hematemesis was brought about by the injury or any blood dyscrasia. It seems to have been an unfortunate coincidence that probably helped bring on the psychosis.

Explanation of the hematemesis is more difficult. There can be no doubt that so called capillary hemorrhage from the stomach may occur. Enormous amounts of blood may be lost in this way and no postmortem evidence be found. Authenticated cases of this type are becoming rarer with better diagnosis and more frequent necropsies. Cases are recorded in which a small ulcer has been found only after serial sections have been made through the gastric mucosa. It is possible that such a situation may have existed here.

It is assumed that there were no ruptured esophageal or gastric varices, that there was no obstruction of the bowel below causing a regurgitation of blood into the stomach, and that the gastritis described could not have been the cause of the hemorrhage. It is not unlikely that a patient in such a mental state may have taken some substance in attempted suicide. Such a substance might produce a gastritis that could conceivably have caused the hemorrhage.

#### CALCIUM THERAPY IN ASTHMA

To the Editor—A 9 year old boy has bronchial asthma. He was tested thoroughly and is receiving proper therapy on that basis with only fair results. I should like to institute calcium therapy. Will you kindly suggest a prescription for him? How long should he be kept on calcium? Are there any dangers in excessive or too prolonged calcium treatment? What is your opinion of its efficacy?

M D New York

ANSWER—Calcium preparations may be prescribed orally, intramuscularly or intravenously, but if useful therapeutically in bronchial asthma a form administered by mouth is probably best. tricalcium phosphate 4 Gm in milk three times daily, calcium lactate 2 Gm four times daily, or calcium gluconate 4 Gm four times daily. Calcium compounds may be administered intramuscularly as a 10 per cent sterile solution of calcium gluconate on alternate days for from ten to fifteen doses. It may be administered intravenously as calcium gluconate or chloride, or as solution of "Afenil," which is a molecular compound of calcium chloride and urea. The latter must be slowly injected and not allowed outside the vein. According to Useful Drugs, edition 10 the solutions of the gluconate and the lactate are less irritating than are those of the chloride. Hence they are preferable for subcutaneous or intramuscular injection and even for intravenous injection when there is any danger of the escape of the fluid into the perivascular tissues. Overdosage must be avoided because the intravenous injection of a very large dose may cause death by paralysis of the heart and the central nervous system. A large but not severely toxic dose by intravenous injection lengthens the coagulation time of the blood.

No harmful effects have been reported from prolonged calcium therapy. It is felt by some that if it is of value at all, the best results are to be obtained by administering it indefinitely. The only untoward effects reported are nausea, headache, fever,



diarrhea, nervousness and a chalky taste in the mouth in sporadic cases, such symptoms call for prompt cessation of the calcium

Some believe that the administration of from ten to fifteen doses at intervals of from two to ten days without relief of asthma would serve to prove the inefficacy of calcium therapy in a given case. Others hold that, in cases which yield to calcium therapy, calcium, preferably by mouth, should be administered for long periods.

The efficacy of calcium in the treatment of bronchial asthma has probably been overestimated, although it cannot be denied that occasional patients are relieved by its administration. In the majority of patients suffering with bronchial asthma calcium administration has not been of service, but if all other methods have failed the use of calcium is certainly worth a long trial.

#### CALCULATION OF TIME OF DELIVERY

To the Editor—Is it possible to calculate from the length of the monthly cycle the time of delivery in those women who carry their child from one or two months overtime?

M D New Jersey

ANSWER—Wahl (*Deutsche med Wchnsch* 63 125 [Jan 22] 1937) studied a series of 9,000 women to determine the length of pregnancy. He found that the average duration of pregnancy was 285 days. This is contrary to prevalent notions based on Naegele's contention that pregnancy lasts on an average of 280 days. Furthermore, Wahl shows that the duration of gestation depends on a woman's menstrual interval. Women with a three weeks menstrual cycle give birth to mature, full term babies earlier than women with a four weeks cycle.

#### Figures Given by Wahl

Type	No of Cases	Duration of Pregnancy	Naegele's
Over 35 days	55	291 22	288 17
35	11	295 18	
30 34	83	284 91	
28 and over	80	288 48	
28	3 382	284 83	284 62
28 or less	61	277 61	
27	7	281 85	
26	18	277 56	
25	26	279 38	
24	18	278 84	
23	5	281 00	
21	67	272 22	
Under 21	31	277 45	277 97
Irregular	156	284 91	

Wahl quotes G Veit as having said that a prolonged menstrual interval bespeaks a prolonged pregnancy. Veit cites other authors who report pregnancies which lasted from 296 to 301 days in women who had twenty-nine and thirty day intervals. He also reports authors who observed pregnancies of ten months and more in women who had a five weeks menstrual cycle.

Wahl's figures may be of assistance in determining the probable date of confinement in a given case, but it must be remembered that the actual cause of the onset of labor is still unknown. Other factors than mere fetal size and duration of pregnancy are of importance.

The practical value of the dependence of the duration of pregnancy on the patient's menstrual interval is this: Whereas in women who have a menstrual interval of four weeks or more there is no hurry about inducing labor if they go beyond the supposed end of pregnancy, it may be advisable to terminate pregnancy at the calculated time in women who have a three weeks cycle.

#### ACUTE APPENDICITIS

To the Editor—In early acute appendicitis what are the effects of (1) a hot water bag applied to the umbilical region for several hours (2) a low bicarbonate enema and (3) a teaspoonful of paregoric for two doses for the severe abdominal cramps? Would the pathologic condition in the appendix be much influenced?

M D New York

ANSWER.—In the presence of suspected early acute appendicitis immediate blood and urine examinations should be obtained. In order to minimize the risk to the patient operation must be performed within the first few hours. In approximately one third of all cases coming to the hospital at the end of twenty-four hours the appendix is ruptured.

A hot water bag applied to the abdomen is in itself harmless but it may produce a sense of false security or temporary relief and delay the diagnosis and operation.

A rectal examination should always be made. If the rectum contains a considerable amount of fecal material, constipation may be suspected to be the cause of the abdominal distress. A small enema of from 120 to 240 cc. of warm water will usually permit evacuation with relief, but, in case the symptoms are not relieved, immediate steps should be taken to establish the correct diagnosis. There is no objection to adding a small amount of sodium bicarbonate to the enema.

It is an established principle that one should never give a sedative or an opiate to a patient with suspected appendicitis or any other condition in which operative delay might lead to an aggravation of the condition. The symptoms become masked sometimes by simple medication. Certainly, a repeated teaspoonful of camphorated tincture of opium might mask the early symptoms, especially in a child, and delay proper diagnosis in others.

Placing the intestine at rest is helpful in any inflammation of the abdomen. In acute appendicitis, when operation may be impossible or inadvisable because of extensive peritonitis, at the first visit one should stop everything by mouth, avoid cathartics and large or irritating enemata, give fluids parenterally, and under these conditions give adequate doses of morphine.

#### DIABETES AND TRAVEL

To the Editor—A patient with diabetes mellitus requiring 80 units of insulin a day is anxious to take a cruise through the West Indies. The trip would take about three weeks. He gets along well, as he is competent in calculating his diet. Do you think there would be any danger in permitting him to make the cruise? I have in mind the possibility that he may become seasick. Kindly advise me at your earliest convenience whether I can safely permit this man to go. He is 45 years old.

M D, New York

ANSWER—Any reliable diabetic patient can take a sea voyage safely, but no matter how seasick he may be he should make every endeavor to take his accustomed quantity of carbohydrate. Ginger ale, orange juice, chicken broth with rice, tea or coffee with sugar, or gruels may be retained when solid food such as cereals, crackers and toast are rejected. If the patient is on protamine zinc insulin it should be continued even if the urine is sugar free and the same holds true for the breakfast dose of regular insulin. If sugar recurs during the day, supplementary doses of regular insulin could be given according to the following formula.

Red	Orange	Yellow	Green	Blue	Color of test
16	12	8	4	0	Units of unmodified insulin

A diabetic patient taking as much as 80 units of insulin a day can most certainly be allowed to make a sea voyage provided his general condition warrants it. With diabetes of this severity, however, the following precautions should be observed: 1 The ship's doctor should know of the prospective passenger well in advance of the sailing so that supplies, including those for the giving of parenteral fluid and dextrose, may be checked. 2 On embarking, the patient should present himself to the ship's doctor and subsequently should report to him if illness arises. 3 The patient should take with him an ample supply of insulin (including unmodified insulin for emergency use) together with simple apparatus for the testing of urine for sugar. 4 It is desirable for an adult and imperative for a child to be accompanied on such a voyage by some responsible person who holds himself accountable for the well being of the patient. If these precautions are observed, no difficulty should be experienced.

#### DUODENAL ILEUS

To the Editor—Could you give me the signs, symptoms, etiology and treatment of duodenal ileus? J N TEETER M D, Englewood N J

ANSWER—Duodenal ileus may be defined as symptomatic obstruction at a point on the duodenum where it is crossed by the superior mesenteric artery in the mesentery of the small intestine. It may occur subsequent to operation or develop suddenly without any obvious cause. Numerous theories have been suggested with little evidence.

After operation it may result from primary dilatation of the stomach with secondary dilatation of the duodenum. This may be due to a number of mechanical factors including downward pressure of the stomach or traction of the small intestine on the root of the mesentery, localized peritonitis or neuromuscular changes in the duodenum. Chronic duodenal ileus may result from similar factors and may be idiopathic or result from some mechanical condition.

In the idiopathic type no pathologic cause has been found at necropsy, but definite evidence points to the superior mesenteric artery as being the distal point of the obstruction, while neuromuscular changes in the duodenum may be important.



factors The chief symptoms of chronic idiopathic duodenal ileus are upper abdominal distention, periodic vomiting, loss of weight and toxic symptoms

Aspiration of the stomach followed by x-ray examination of the duodenum after a barium sulfate meal, which may be done in the chronic type, will show dilatation and usually active reverse peristalsis Acute duodenal ileus after operation is usually relieved by repeated aspiration with a stomach tube, although constant suction through a nasal tube is frequently valuable Persistence of symptoms would suggest adhesions producing a mechanical obstruction, and reoperation would be indicated

The chronic type, which is frequently intermittent with acute attacks, may be treated in a similar manner or the passage of a duodenal tube may be attempted Between attacks small and frequent feedings may be of value There is frequently failure to obtain relief and operation is indicated

If mechanical factors such as anomalous bands or pathologic changes cannot be found and the obstruction removed, it may be considered to be idiopathic duodenal ileus

The operation of choice in the idiopathic type is a lateral anastomosis of the second portion of the duodenum to a loop of jejunum 8 or 10 inches from its origin

#### POSSIBLE JUVENILE DEMENTIA PARALYTICA

To the Editor—A boy aged 12 years has congenital syphilis He had inadequate treatment of mercury rubs and bismuth preparations until 4 years of age At that time the spinal fluid was positive and the blood Wassermann reaction four plus Intensive and continuous treatment was then given for two years with sulfarsphenamine tryparsamide, his muth compounds and potassium iodide He was allowed to rest about five months as the spinal fluid and blood Wassermann reactions were negative Potassium iodide by mouth however was given during these five months At the end of this period he had severe convulsions which lasted twelve hours The spinal fluid and blood Wassermann reactions were still negative Continuous treatment except with six rest periods of four weeks each with neoarsphenamine, tryparsamide and bismuth compounds were then given until the present date The spinal fluid and blood Wassermann reactions have been negative all this time The boy is physically well developed He does not have saddle nose keratitis or Hutchinsonian teeth The heart lungs and abdominal organs are normal The boy has a few bad habits He swears whenever he gets provoked He is disobedient He will take money from his parents He is nervous although he sleeps well He bites his finger nails He taps the floor with his feet if he has to sit still very long He has a good appetite but bolts his food He does not masturbate and he does not care to play with girls He gets along fairly well with boys but in all his play with them he wants to run the whole show and he gets very angry if they cross him He has had two years of public school but is very trying to the teachers Mostly he has had private tutoring He can read and write well and works fourth grade arithmetic He is becoming difficult for his parents to handle and is an only child Should present treatment be discontinued? Can you suggest any further treatment? Can you suggest any private school or institution for this type of child? MD Illinois

ANSWER—The diagnosis of juvenile dementia paralytica is strongly suggested in this child and its possibility should be further investigated by consultation with a psychiatrist An aid in the diagnosis of juvenile dementia paralytica would be the additional observations in the spinal fluid In spite of the fact that the spinal fluid Wassermann test is said to have been negative since about the age of 6, it was originally positive One would like to know the present status of the cell count, quantitative protein estimation, the amount of spinal fluid with which the Wassermann test was done, and the colloidal mastic curve

If the diagnosis of juvenile dementia paralytica is substantiated, treatment should certainly not be discontinued until the child has been given induced malaria

There are a number of private schools for this type of child, particularly suitable if the child does not have juvenile dementia paralytica Definite suggestions for such a school may be obtained from a psychiatrist experienced in the management of difficult children

#### VINCENT'S INFECTION OF URETHRA

To the Editor—Please outline for me or send me references concerning the best treatment for Vincent's infection of the urethra The patient is already receiving neoarsphenamine intravenously MD New Jersey

ANSWER—References to Vincent's infection of the urethra are rare in recent literature and standard textbooks Regarding treatment, several points should be emphasized Arsphenamine should not be given intravenously until syphilis has been conclusively ruled out, and even then many believe that arsphenamine does more good as a topical application to the inflamed area Repeated cleansing daily by the patient with a weak solution of potassium permanganate or soap and water with special care that the preputial cavity is thoroughly exposed is

advocated The urethra should be irrigated daily by the physician with a weak solution of potassium permanganate under low pressure and a 2 per cent hydrogen peroxide injection done, with, of course, no attempt being made to retain the solution in the canal

The prognosis in Vincent's infections is good if the infected areas are kept clean and exposed to oxygen, but if the inflammatory process proves stubborn, neoarsphenamine in small doses (from 0.2 to 0.3 Gm) may be given once or twice, and some recommend 5 cc of 1 per cent antimony and potassium tartrate solution given intravenously very slowly

#### ESTERS OF PARAHYDROXYBENZOIC ACID AS PRESERVATIVES AND ANTISEPTICS

To the Editor—A nose and throat specialist in a neighboring city prescribes a solution to be instilled in the eyes for attacks of hay fever which is said to be quite effective The prescription includes a small amount of zinc sulfate and tincture of eucalyptus in a solution of 2 grains (0.13 Gm) of N-propyl P-hydroxyl benzoate to a pint of distilled water This last mentioned drug is obtainable only through the Eastman Company and no one of my acquaintances has heard of it before Can you tell me something of its action and uses? MD Texas

ANSWER—Several esters of para-hydroxybenzoic acid (parahydroxybenzoic acid) have been introduced as antiseptics especially for the purpose of preserving foods, medicines and cosmetics Usually the substances are referred to by trade names, for instance, the propyl ester as "Nipazol M," the ethyl ester as "Nipagin A," the methyl ester as "Nipagin M" These "Nip" preparations are of German origin and are sold in this country by the Goldschmidt Corporation, 147 Waverly Place, New York City

#### References

- The Preserving Power Chemical Identification and Pharmacology of p-Hydroxybenzoic Esters *Ztschr f angew Chem* 42 936 1929  
abstr Chem Abstr 1930 p 160  
Pharmacology of Some p-Hydroxybenzoic Acid Esters Their Fate in the Organism and Toxicity *Arch f exper Path u Pharmacol* 146 208 1929 abstr Chem Abstr, 1930, p 4834 (Animal experiments with the ethyl methyl and propyl esters indicate that the methyl ester is the most toxic while the propyl ester is the strongest antiseptic)  
The Use of p-Hydroxybenzoic Esters in Sterilization and Disinfection *Pharm acta helv* 5 286 1930 abstr Chem Abstr, 1931, p 1638  
Use of Nipazol for Sterilization *Sueddische Apoth Ztg* 1931 p 731  
abstr Quart J Pharmacy & Pharmacol 1932 p 117  
*Apotheker Zeitung* May 25 1932 p 630 In this paper Eschenbrenner reports favorably on the preservation of various collyriums with either Nipazol M or its sodium salt in concentrations of 0.04 or 0.1 per cent  
Disinfectant Action of Nipazol Sodium in Tissue Fluids, *Zentralbl f Bakt* Nov 1 1933 p 138  
Sterilization Experiments on Eye Waters with Hydroxybenzoic Esters *Pharm acta helv* 10 103 1935 abstr Chem Abstr 1936 p 3166  
Remington's Practice of Pharmacy Philadelphia J B Lippincott Company 1936

The Eastman Kodak Company supplies the information that N-propyl-P-hydroxybenzoate was prepared in their laboratory to be used only in chemical research The company had no idea that it was used for the medical purpose mentioned Methyl-P-hydroxybenzoate and ethyl P-hydroxybenzoate are much in use as general preservatives, particularly in the food and drug field, and while they have no details to report, N-propyl-P-hydroxybenzoate has also been investigated from this standpoint

#### RELATION OF ARTERIAL AND VENOUS PRESSURE

To the Editor—What is the relation of venous blood pressure to arterial pressure especially high blood pressure?

J E SCHMIDT MD Baltimore

ANSWER—There is no fixed or mathematical relationship between the venous pressure and the arterial tension Both levels of pressure tend to fall with rest or sleep, but otherwise they vary quite independently It is claimed by many investigators that abnormally high venous pressure invariably means cardiac failure, irrespective of the cause of the failure On the other hand, there have been reported observations, both here and abroad, which indicate that a moderate increase in the venous pressure may occur in hypertensive states without demonstrable cardiac failure These opposed views may both be correct, since very early impairment of the cardiac reserve may be almost undetectable It must be emphasized that the venous pressure besides being highly susceptible to the effects of gravity (it is properly measured only at the level of the heart), arises from two independently variable factors the rate of capillary blood flow and the back pressure from the heart In hypertensive arterial disease the precapillary arterioles are constricted and thus the capillary flow is usually reduced The greater the arteriolar constriction, the poorer the capillary cir-

culation But there may be certain hypertensive states in which arteriolar constriction is absent or minimal, as, for example in the systolic hypertension of hyperthyroidism or the hypertension of coarctation of the aorta In such instances, with the capillary flow increased, some rise in the venous pressure can well be expected even without cardiac incompetence Thus any relationship that may exist between the arterial and venous pressures is dependent on the state of the arterioles and the subsequent extent of the capillary blood flow Physical exertion has little or no effect on the venous pressure in health, but when there is cardiac depletion exertion results in a notable rise of the venous pressure (from 2 to 7 cm of water pressure) The arterial tension normally varies much more with exertion, fatigue, excitement, fear or relaxation

#### SYPHILOPHOBIA

*To the Editor*—A man, aged 43, contracted syphilis during the war This was first discovered during a rheumatic attack He was given treatment for fifteen months in the navy and after his discharge he went to a private physician for two more years The physician discharged him and told him that he might marry His treatment was one month of neosphenamine and one month of a bismuth compound He was married three years afterward and two normal children were born During the pregnancy his wife had hypertension and kidney trouble At present she has a blood pressure of 190 systolic 100 diastolic the urine is clear and there is no albumin or casts She complains of headache backache and itchiness of the skin Her husband insists that she has syphilis Her first Wassermann reaction was negative and after a provocative dose of neosphenamine it was again negative Could it be possible that she has syphilis?

M D New Jersey

*ANSWER*—It is not possible to state definitely from the data submitted that the woman does or does not have syphilis The information with regard to the amount of treatment the husband received and the status of his blood and spinal fluid are not the criteria to determine the wife's status As her blood tests have been repeatedly negative and if the children's tests are also negative, if the mother's spinal fluid is negative and if she shows no clinical signs of syphilis, the question of her having syphilis can be dropped None of the wife's symptoms described in the inquiry seem to be attributable to syphilis

#### SCARLET FEVER WITHOUT PHARYNGITIS

*To the Editor*—A girl aged 8 years had a temperature of 102 F with a mild scarlet fever like rash over her body and on the inside of the arms and a slight circumoral pallor At no time has she had a sore throat A diagnosis of mild scarlet fever was made Is it possible to have a scarlet fever without a sore or infected throat

M D Michigan

*ANSWER*—If a person who is only slightly susceptible to scarlet fever, in other words a person who has considerable scarlet fever antitoxin in his blood but not quite enough to protect against any manifestation of the disease becomes infected with scarlet fever streptococci in the throat, he may have so slight a sore throat that it is unnoticed

It is also possible for scarlet fever to result from the specific streptococci entering the body at some point other than the throat, such as a sinus, surgical lesion or the puerperal uterus

#### CONVULSIONS IN YOUNG GIRL

*To the Editor*—A girl aged 5 has been troubled from birth with obstinate constipation There is also a past history of unexplained attacks of fever In January 1937 gastro intestinal roentgenograms showed a marked elongation of the pelvic or sigmoid colon with no dilatation She has had two convulsions occurring at night one in March and one in July Following the attacks she was normal except for slight and transient dermatitis on the face and chest Physical examination is entirely negative except for a palpable spleen The urine and blood are normal except for the differential count which showed 46 per cent polymorphonuclears 17 per cent eosinophils 34 per cent lymphocytes and 3 per cent monocytes The day after the count was made the patient developed high fever Repeated examinations of the stools have been negative for parasites The patient has no other signs of allergy There is a history of epilepsy in the father's immediate family and distantly in the mother Is this likely to be a case of early epilepsy or convulsions due to the elongation of the colon? What is the prognosis and what treatment would you advise?

JOHN M KIDD M D Gilson Ohio

*ANSWER*—The obstinate constipation may be due to or the cause of the elongation of the colon However the finding of an elongation or redundant loops of the colon is not unusual and has no particular significance It would be impossible to make a diagnosis on the simple statement of two nocturnal convulsions Information concerning the type of convulsions and the association with infection or fever would be valuable

It is quite possible that the attacks of fever are associated with a recurrent pyelonephritis The urine may be "normal" between attacks Culture of a catheterized specimen should be made and repeated if negative The 17 per cent eosinophil count may be attributed to the allergy It may be stated that the convulsions are not per se the result of the elongation of the colon If the convulsions were not preceded by infection or fever, if they were generalized in type and were followed by coma or stupor, it is possible that they are the first seizures of idiopathic epilepsy The palpable spleen has no particular significance It is advisable to examine the optic disks to obtain a Wassermann test on both blood and spinal fluid and to complete the examination of the spinal fluid It is impossible to determine the prognosis There is no particular treatment except to correct the constipation and to prescribe a normal diet If possible the next convulsion should be observed or reported in detail This information may make it possible to give a diagnosis

#### MENTHOLATED CIGARETS

*To the Editor*—Not long ago somewhere in the literature I read of some cardiac deaths attributed to the smoking of mentholated cigarettes. Has this fact been borne out definitely and if so how many cases have been reported?

B H BAYER, M D Houston Texas

*ANSWER*—Neither the Anticigarette League nor the manufacturer of mentholated cigarettes was able to locate the reference mentioned The answer given in Queries and Minor Notes in THE JOURNAL, Jan 16, 1937, page 229, that "there is no evidence that the smoking of mentholated cigarettes is harmful because of the menthol" appears well founded The amount of menthol in such cigarettes is so small in proportion to the amount of nicotine and other agents which may be expected to affect the heart and the absorption of menthol in the smoke, accordingly, so much less than occurs with the common use of mentholated nose and throat applications, that it is highly improbable that the menthol in cigarettes could ever be really responsible for cardiac deaths

#### FOOT BATH FOR PREVENTION OF RINGWORM

*To the Editor*—Kindly give me directions for making a prophylactic foot bath for use in the shower bath of a gymnasium

F W LINV, M D Cleveland

*ANSWER*—A most efficient foot bath for the prevention of ringworm infection is that proposed by Earl D Osborne and Blanche S Hitchcock (The Prophylaxis of Ringworm of the Feet THE JOURNAL Aug 15, 1931, p 453) A 1 per cent solution of sodium hypochlorite is filled to the depth of 2 inches in a rubber pan about 2 feet square or in a well sunk in the gymnasium floor Each person is required to step both feet in this bath on the way to the shower and again on the return The solution should be changed every second day

#### ELECTRICITY AS CAUSE OF DEATH

*To the Editor*—Are there any postmortem tests of the blood or the organs which would be proof of death by electricity

FRANK G CALDER M D Johnstown Pa

*ANSWER*—There are no such dependable tests Lightning may cause lightning marks red arborizations of the skin or diffuse skin burns and rarely may fracture bones and disrupt organs The electric current of low voltage may produce no marks Even high voltage current where conduction is good may leave no marks Usually there are burns at the points of contact often with electrolytic metal deposits and sometimes burns or hemorrhage at the points of exit The internal organs may show hemorrhages, which are not distinctive The blood is always fluid Death may be due to the heating of the brain (up to 145 F) and vacuolation about vessels with changes in ganglion cells have been reported Exclusion of other adequate causes of death, with the circumstantial evidence is often helpful

#### CALOMEL DUSTING POWDER IN HOSPITAL NURSERY

*To the Editor*—Is there any danger in the use of a talcum dusting powder containing calomel in a hospital nursery for the treatment of impetigo? If not what percentage should be used

M D New York

*ANSWER*—There is no danger in the addition of mild mercurous chloride (calomel) to talcum powder in which it may be incorporated to the extent of from 10 to 20 per cent provided the patient does not receive iodide internally

## Council on Medical Education and Hospitals

### ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, Dec 18, 1937

#### Hospitals Approved for Intern Training

St Anthony's Hospital Terre Haute Ind  
House of Mercy Hospital Pittsfield Mass  
St Luke's Hospital Pittsfield Mass  
Lutheran Deaconess Home and Hospital Minneapolis  
Margaret Pillsbury General Hospital Concord, N H  
St James Hospital Newark N J  
Mount Vernon Hospital Mount Vernon N Y  
Women's and Children's Hospital Toledo Ohio  
Medical Arts Hospital Dallas Texas  
Nix Hospital San Antonio Texas  
Providence Sanitarium Waco Texas  
St Luke's Hospital Milwaukee

#### Hospitals Approved for Residencies in Specialties

##### Anesthesia

Harper Hospital Detroit  
Columbia Hospital Milwaukee

##### Gynecology

Harlem Hospital New York City

##### Malignant Disease

Brooklyn Cancer Institute of Kings County Hospital Brooklyn

##### Medicine

Joseph H Pratt Diagnostic Hospital Boston  
Huron Road Hospital East Cleveland Ohio  
Parkland Hospital Dallas Texas

##### Mixed

McMillan Hospital Charleston W Va

##### Neurophysiology

Michael Reese Hospital Chicago  
Northampton State Hospital Northampton Mass  
Central Islip State Hospital Central Islip N Y  
Western State Hospital Fort Steilacoom Wash

##### Neurosurgery

Jewish Hospital Brooklyn  
Hospital of the University of Pennsylvania Philadelphia

##### Obstetrics

Cooper Hospital Camden N J  
Fordham Hospital New York City  
Harlem Hospital New York City  
Parkland Hospital Dallas Texas

##### Obstetrics Gynecology

Jewish Hospital Brooklyn

##### Ophthalmology

Colorado General Hospital Denver

##### Orthopedics

Temple University Hospital Philadelphia  
Parkland Hospital Dallas Texas

##### Otolaryngology

Jewish Hospital Brooklyn

##### Pathology

Grady Hospital Atlanta Ga  
Mountainside Hospital Montclair N J  
Fordham Hospital New York City  
Baylor University Hospital Dallas Texas  
Queen's Hospital Honolulu Hawaii

##### Pediatrics

Children's Hospital Birmingham Ala  
Morrisania City Hospital New York City

##### Radiology

Colorado General Hospital Denver  
Harper Hospital Detroit  
Jewish Hospital Brooklyn  
Methodist Episcopal Hospital Brooklyn  
Morrisania City Hospital New York City  
Baylor University Hospital Dallas Texas  
Parkland Hospital Dallas Texas

##### Surgery

St Luke's Hospital San Francisco  
William W Backus Hospital Norwich Conn  
Butterworth Hospital Grand Rapids Mich  
Coney Island Hospital Brooklyn  
Jewish Hospital Brooklyn

Meadowbrook Hospital Hempstead N Y  
Parkland Hospital Dallas Texas  
St Mary's Hospital Milwaukee

##### Thoracic Surgery

Sanatorium Division of the Boston City Hospital Boston  
University Hospital Ann Arbor Mich

##### Tuberculosis

Gaylord Farm Sanatorium Wallingford Conn  
Kingston Avenue Hospital Brooklyn

##### Urology

Harper Hospital Detroit

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

ALABAMA Montgomery June 28 Sec Dr J N Baker 519 Dexter Ave Montgomery  
ARIZONA Phoenix April 56 Sec Dr J H Patterson 826 Security Bldg Phoenix  
ARKANSAS Basic Science Little Rock June 4 Sec Mr Louis E Gebauer 701 Main St Little Rock Medical (Regular) Little Rock June 21 22 Sec State Medical Board of the Arkansas Medical Society Dr L J Kosminsky Texarkana Medical (Eclectic) Little Rock June 21 Sec Dr Clarence H Young 1415 Main St Little Rock  
CALIFORNIA Reciprocity San Francisco May 11 Los Angeles July 11 San Francisco Sept 14 and Los Angeles Nov 16 Written examinations San Francisco June 27 30 Los Angeles July 11 14 and Sacramento Oct 17 20 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento  
COLORADO Denver April 68 Sec Dr Harvey W Snyder 831 Republic Bldg Denver  
CONNECTICUT Medical Endorsement Hartford March 22 Sec Dr Thomas P Murdock 147 W Main St Meriden Basic Science New Haven June 11 Prerequisite to license examination Address State Board of Healing Arts 1895 Yale Station New Haven  
DELAWARE Dover July 12 14 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover  
DISTRICT OF COLUMBIA Basic Science Washington June 27 28 Medical Washington July 11 12 Asst Sec Commission on Licensure Mr Paul Foley 203 District Bldg Washington  
FLORIDA Jacksonville June 13 14 Sec Dr William M Rowlett Box 786 Tampa  
GEORGIA Atlanta June Joint Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta  
HAWAII Honolulu April 11 14 Sec Dr James A Morgan 48 Alexander Young Bldg Honolulu  
IDAHO Boise April 56 Commissioner of Law Enforcement Hon J L Balderston 205 State Capitol Bldg Boise  
ILLINOIS Chicago April 57 June 28 July 1 and Oct 18 20 Superintendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield  
INDIANA Indianapolis June 21 23 Sec Board of Medical Registration and Examination Dr J W Bowers 301 State House Indianapolis  
KANSAS Kansas City June 7 8 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N 7th St Kansas City  
KENTUCKY Louisville June 8 10 Sec State Board of Health Dr A T McCormack 620 S 3rd St Louisville  
MARYLAND Medical (Regular) Baltimore June 21 24 Sec Dr John T O'Mara 1215 Cathedral St Baltimore Medical (Homeopathic) Baltimore June 21 22 Sec Dr John A Evans 612 W 40th St Baltimore  
MICHIGAN Ann Arbor and Detroit June 15 17 Sec Board of Registration in Medicine Dr J Earl McIntyre 202 34 Hollister Bldg Lansing  
MINNESOTA Basic Science Minneapolis April 5 6 Sec Dr J Charnley McKinley 126 Millard Hall University of Minnesota Minneapolis Medical Minneapolis April 19 21 Sec Dr Julian F Du Bois 300 St Peter St St Paul  
MISSISSIPPI Jackson June Asst Sec State Board of Health Dr R N Whitfield Jackson  
MONTANA Helena April 5 6 Sec Dr S A Cooney 205 Power Block Helena  
NEBRASKA Basic Science Omaha May 3 4 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln  
NEVADA Carson City May 2 Sec Dr John E Worden Capitol Bldg Carson  
NEW JERSEY Trenton June 21 22 Sec Dr James J McCuire 28 W State St Trenton  
NEW MEXICO Santa Fe April 11 12 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe  
NEW YORK Albany Buffalo New York and Syracuse June 27 30 and Sept 19 22 Chief Professional Examinations Bureau Mr Herbert J Hamilton 315 Education Bldg Albany  
NORTH CAROLINA Raleigh June 13 Sec Dr B J Lawrence 503 Professional Bldg Raleigh  
NORTH DAKOTA Grand Forks July 8 Sec Dr C M Williamson 41 S 3rd St Grand Forks  
OKLAHOMA Basic Science Oklahoma City May 4 Sec of State Hon Frank C Carter State Capitol Bldg Oklahoma City Medical Oklahoma City June 8 9 Sec Dr James D Osborn Jr Frederick  
OREGON Basic Science Corvallis July 16 and Portland Nov 19 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene Medical Reciprocity Portland April 6 Sec Dr Joseph F Wood 509 Selling Bldg Portland  
PENNSYLVANIA Philadelphia and Pittsburgh July Sec Board of Medical Education and Licensure Dr James A Newpher 400 Education Bldg Harrisburg  
RHODE ISLAND Providence April 7 8 Chief Division of Examiners Mr Robert D Wholes 366 State Office Bldg Providence

**SOUTH CAROLINA** Columbia June 28 Sec Dr A Earle Boozer  
505 Saluda Ave Columbia

**SOUTH DAKOTA** July 19 20 Director of Medical Licensure Dr B A  
Dyar State Board of Health Pierre

**TEXAS** San Antonio June 20 22 Sec Dr T J Crowe 918 Mer  
cantile Bldg Dallas

**VERMONT** Burlington June 15 17 Sec Board of Medical Registra-  
tion Dr W Scott Nay Underhill

**VIRGINIA** Richmond June 22 24 Sec Dr J W Preston 30 1/2  
Franklin Road Roanoke

**WEST VIRGINIA** Huntington March 21 23 Sec Public Health  
Council Dr Arthur E McClue State Capitol Charleston

**WISCONSIN** Basic Science Madison April 2 Sec Prof Robert N  
Bauer 3414 W Wisconsin Ave Milwaukee Medical Milwaukee June  
28 July 1 Sec Dr Henry J Gramling 2203 S Layton Blvd  
Milwaukee

#### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special  
Boards were published in THE JOURNAL March 12 page 835

#### California October Examination

Dr Charles B Pinkham secretary, California State Board  
of Medical Examiners, reports the written examination held  
at Sacramento, Oct 19-21, 1937 The examination covered  
9 subjects and included 90 questions An average of 75 per  
cent was required to pass Fifty-two candidates were examined,  
47 of whom passed and five failed The following schools were  
represented

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists	(1936) 84	(1937) 78	88 3
Stanford University School of Medicine	(1934) 85 3	(1937) 80 3	80 8
University of California Medical School		(1937)	79 8
80 7 86 86 6 87 7			
Yale University School of Medicine		(1936)	83
George Washington University School of Medicine		(1936)	78
Loyola University School of Medicine		(1922)	88 9
Northwestern University Medical School	(1934) 80 8	(1936)	88 1*
University of Illinois College of Medicine		(1937)	80 2
State University of Iowa College of Medicine		(1936)	82 9
Wayne University College of Medicine		(1936)	87 1
St Louis University School of Medicine		(1937)	79 9
Washington University School of Medicine		(1936)	79 3
88 3 (1937) 83 1			
Creighton University School of Medicine	(1936) 78 7	(1937)	77 7
Lincoln Medical College Nebraska		(1916)	78 6
Cornell University Medical College		(1920)	80 8
Ohio State University College of Medicine		(1937)	82 3
University of Oklahoma School of Med	(1935) 83 2	(1936)	83 2
University of Oregon Medical School		(1937)	85 8
University of Pennsylvania School of Medicine		(1936)	83 6
Baylor University College of Medicine		(1937)	76 9
University of Toronto Faculty of Medicine	(1931) 83 4	(1934)	84 4
McGill University Faculty of Medicine	(1935) 83 7	(1936)	85 1
Julius Maximilians Universität Medizinische Fakultät Würzburg		(1923)	77 1†
Ludwig Maximilians Universität Medizinische Fakultät München	(1922) 82 8	(1924) 86 8 †	(1925) 84
Universität Heidelberg Medizinische Fakultät		(1922)	86 1†
Vereinigten Friedrichs Universität Medizinische Fakultät Halle Wittenberg		(1920)	75 6†
Magyar Királyi Pazmany Petrus Tudományegyetem Or- vosi Fakultása Budapest		(1935)	76 2
School	FAILED	Year Grad	Per Cent
University of Arkansas School of Medicine		(1933)	72 4
Northwestern University Medical School		(1931)	73 7
Tufts College Medical School		(1934)	73 8
Hamburgische Universität Medizinische Fakultät		(1920)	†
Ludwig Maximilians Universität Medizinische Fakultät München		(1931)	60 1

Fifty physicians were licensed by reciprocity and seven physi-  
cians were licensed by endorsement from October 6 through  
December 27 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1929)	Arkansas
College of Medical Evangelists		(1934)	Ohio
University of Colorado School of Medicine	(1935)	(1936)	Colorado
Emory University School of Medicine		(1936)	Georgia
Chicago College of Medicine and Surgery		(1915)	Nebraska
Northwestern University Medical School		(1909)	Illinois
(1928) Indiana (1933) Ohio (1936) Colorado			
Rush Medical College		(1906) South Dakota	(1934) Utah
University of Illinois College of Medicine		(1932)	Illinois
Indiana University School of Medicine		(1935 2)	Indiana
State University of Iowa College of Medicine		(1928)	Montana
(1930) Iowa			
University of Kansas School of Medicine		(1933)	
(1934) Kansas (1935) Arizona			
Harvard University Medical School	(1907) Connecticut	(1923)	Tennessee
Tufts College Medical School	(1933)	(1937)	Mass
University of Minnesota Medical School	(1934)	(1936)	Minnesota
St Louis University School of Medicine	(1927)	(1935)	Missouri
Washington University School of Medicine		(1929)	North Dakota
Creighton University School of Medicine		(1922)	S Dakota
University of Nebraska College of Medicine			
(1929) (1932) Nebraska			
Albany Medical College		(1928)	New York
Ohio State University College of Medicine		(1936)	Ohio

Jefferson Medical College of Philadelphia (1896) N Dakota  
(1927) Pennsylvania

Temple University School of Medicine (1935) Penna  
Baylor University College of Medicine (1936) Texas  
University of Wisconsin Medical School (1930) Missouri  
University of Manitoba Faculty of Medicine (1929) Washington  
Queen's University Faculty of Medicine (1914) Iowa  
University of Toronto Faculty of Medicine (1934) Missouri  
McGill University Faculty of Medicine (1929) New York  
Karl Franzens Universität Medizinische Fakultät Graz (1924) Illinois  
Medizinische Fakultät der Universität Wien (1926) Iowa  
Licentiate of the Royal College of Physicians of London  
and Member of the Royal College of Surgeons of  
England (1910) New York

Friedrich Wilhelms Universität Medizinische Fakultät  
Berlin (1927) Illinois  
University of Edinburgh Faculty of Medicine (1931) New York  
Université de Lausanne Faculté de Médecine (1919) New York

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad of
College of Medical Evangelists	(1935)	(1936) N B M Ex
Emory University School of Medicine		(1930) U S Navy
Loyola University School of Medicine		(1931) U S Navy
Northwestern University Medical School		(1928) N B M Ex
University of Michigan Medical School		(1933) N B M Ex
University of Pennsylvania Department of Medicine		(1905) U S Navy

\* This applicant has received the M B degree and will receive the  
M D degree on completion of internship  
† Verification of graduation in process  
‡ Grade not reported Verification of graduation in process

## Book Notices

**A Pediatrician in Search of Mental Hygiene** By Bronson Crothers  
M D Assistant Professor of Pediatrics Harvard Medical School Boston  
Cloth Price \$2 Pp 271 New York Commonwealth Fund London  
Oxford University Press 1937

As the title implies, this volume is in no sense a textbook  
Rather it is a philosophic discussion of an important problem  
or group of problems Some of the questions many pediatricians  
would like to have answered are "What is the function of the  
pediatrician in the program of mental hygiene or more speci-  
cally what shall he do about the psychologic and psychiatric  
difficulties of his patients what is the function of the pediatric  
teacher in these problems, what also is the job of the hospital  
and clinic?" There is no mathematical answer and, as stated  
the arguments must be essentially philosophic In support of  
his own argument and in his criticism of those of others,  
Dr Crothers brings to bear his usually significant terminology  
and persuasiveness, and his conclusions, when he reaches them  
are to be treated with the respect which his intelligence and  
experience warrant He explains that he is a conventionally  
trained pediatrician who has kept up an interest in neurology  
and who has had a period of training in a neurophysiologic  
laboratory The first part of the book is divided into a rather  
rambling discussion of such subjects as the doctor in the com-  
munity, mental hygiene as a pediatric investment, and the  
pediatrician in cooperation with others interested in children  
In part two there is more specific detailing of medical education  
the children's hospital the child guidance clinic and a teaching  
experiment in action in a children's hospital in Boston, there  
are other chapters which end with a survey and summary of  
the present situation accompanied by certain recommendations  
Since Dr Crothers makes his statements cautiously, he is  
difficult to quote with exactness Among his conclusions, how-  
ever are the following There should be improvement of  
physical care of children who are not sick in the ordinary sense  
there should be the most effective use of the best present  
standards of physical growth and development, there should  
be selection of relevant material from the vast source of accurate  
information collected by psychologists on mental development  
and utilization of this material in appropriate medical situations  
There should be a serious attempt to select and adopt the  
relevant attitudes and techniques of psychiatry, the first step in  
this being to search for material which is important in relation  
to the usual pediatric problems of physical and psychic dis-  
orders There are several important negative statements which  
suggest that the pediatrician should not expect to duplicate the  
work of the trained psychiatrist interested in children that he  
should hesitate to undertake the study of delinquency or try to  
deal with children whose behavior suggests the presence of  
mental disease as ordinarily understood that he should not  
regard prevention of mental disease as within his capacity and  
above all that he should not allow himself to get into a position

in which he takes diagnostic or therapeutic charge of an adult as an incident of treating a child. It is obvious that Dr Crothers does not believe that many pediatricians are competent in the field of mental hygiene and that a program of this sort needs the help of others with more specific training. He does not want anything to happen to the pediatrician which will prevent him from meeting his fundamental duty of giving prompt, effective and intelligent care to sick children. One is tempted to quote further, but those who are interested, and they should be many, must consult the book in its entirety.

**The Collapse Therapy of Pulmonary Tuberculosis** By John Alexander  
BS MA MD Professor of Surgery University of Michigan  
Cloth Price \$15 Pp 705 with 367 illustrations Springfield Illinois & Baltimore Charles C Thomas 1937

When Alexander's first book on thoracic surgery appeared, in 1925, it stimulated a wide interest in the subject and provided physicians with much information concerning a subject that was relatively new. In the past twelve years, chest surgery has developed with great rapidity and no one has had finer experience, has made better contributions, has stimulated more general interest or has done better teaching of students and graduates in medicine than Alexander. Therefore it is particularly fitting that he has brought together, in collaboration with three other physicians who are among the best in their specialties, all the available information on collapse therapy of pulmonary tuberculosis. This book includes every phase of collapse therapy, as well as the history of the various surgical procedures and the technique of operations, together with the indications and contraindications for each. It is of use not only to the surgeon but also to the internist and the general practitioner. Indeed, every physician must know of the possibilities of collapse therapy in pulmonary tuberculosis in order that he may treat his patients by the most modern methods or recommend, at the time these are indicated, surgical aid. For such information Alexander's book is authentic and contains the last word on the subject of collapse therapy of pulmonary tuberculosis. It is a fine example of modern American printing. The type page is larger than is usually seen, but it is beautifully proportioned and the clear and sharp type used is well arranged for ease in reading. The book is unique in using double columns for the first five chapters and single columns for the chapters devoted to operation. The paper is admirably adapted to bring out the detail of superb illustrations of roentgenograms and line drawings. It is a rare medical book that reflects in any such degree the qualities of the really good and adequate presswork seen throughout the book, which, in great measure, may be considered to represent a decided step forward in its physical perfections of presswork, paper and binding. All in all the book sets a new standard in format and make up for American medical works. One might write many pages on the excellent qualities of this book but suffice it to say that it should be available to every physician.

**Traité d'hélmintologie médicale et vétérinaire** Par M. Neveu-Lemaire  
professeur agrégé chef des travaux de parasitologie à la Faculté de médecine de Paris  
Paper Price 175 francs Pp 1514 with 787 illustrations Paris Vigot Freres 1936

This falls into four unequal parts. The first opens with a historical review and describes parasitism by helminths, their habitat, localization, reproduction, life cycle and intermediate hosts of larval stages, portals of entry into hosts, migrations within the body of the host, paths of exit from hosts, geographic distribution, effects on the host, cellular and humoral reactions of the parasitized organism, effects on the intermediate invertebrate hosts, effects of the host on its helminth parasites, methods of examination and study of helminths and nomenclature of helminths and helminthiases. The second, or main part of the book contains the special helminthology, in which the different species of trematodes cestodes nematodes and acanthocephalid worms of man and his domestic animals are described figured and classified according to the latest zoological information and in accordance with the International Rules of Nomenclature. Each species is given a uniform presentation including synonymy morphology habitat, ecology geographic distribution, hosts and pathogenic role. Each helminthiasis is passed in review with reference to its symptomatology pathogenesis, patho-

logic anatomy, etiology, diagnosis, prognosis, treatment and prophylaxis. Tabular views of the distinguishing characteristics of related species are set up to assist in identification of species of important genera. The third part is a catalogue of all the known helminths parasitic in the forty-five domesticated mammals and thirty-nine birds. *Homo sapiens* has to his discredit forty different flukes, thirty-three tapeworms, sixty-seven roundworms and two acanthocephalids. The fourth part contains the lists of intermediate hosts, vertebrates, mollusks, arthropods and annelids, and designations of the stages which they harbor, knowledge of which is essential for preventive measures.

Any work of such scope as this is necessarily incomplete, partly because of lack of material, more often because the original investigator omitted or could not obtain essential data. Such a classified compilation brings these deficiencies into high relief and opens the way for the completion of needed information. One of the most trying deficiencies is the lack of figures and measurements of ova on which diagnosis of infections so largely rests. The book is a mine of information not only on well known helminths but also on the rarer and occasional ones which the physician and veterinarian may sometimes meet.

**Recent Advances in the Study of Rheumatism** By Frederic John Poynton MD FRCP Consulting Physician University College Hospital and the Hospital for Sick Children Great Ormond Street and Bernard Schlesinger MA MD FRCP Physician to the Children's Department Royal Northern Hospital London  
Second edition Cloth Price \$5 Pp 380 with 51 illustrations Philadelphia P Blakiston's Son & Co Inc 1937

Twenty-one of the twenty three chapters in this book are written by two of the best investigators of acute rheumatic fever and of the chronic forms of arthritis. Both have contributed much to knowledge of these diseases. In this edition they have presented the new as well as the more established ideas about etiology, bacteriology, pathology and treatment of rheumatic diseases. There is an excellent review of the literature of rheumatic fever, dealing with predisposing causes, pathology, bacteriology, tonsillitis and rheumatism, allergic factors, electrocardiography, immediate treatment with drugs, vaccine and serum therapy, and convalescent treatment. There is a shorter but good review of the recent work on rheumatoid arthritis and osteo arthritis, with chapters on the comparison of acute and chronic types of rheumatism, industrial aspects, predisposing causes, pathology and radiology, bacteriology, focal infection, constitutional disturbances, clinical problems and treatment. The last includes general measures, vaccines, protein shock, apiotherapy, histamine, diet, gold salts and sulfur. The many conflicting opinions expressed in the literature regarding etiology and treatment make this critical review of the literature of utmost value to minimize faddism in the treatment of rheumatism and in helping to evaluate present information for its practical application in the understanding and treatment of rheumatism. The whole subjects of rheumatic fever, rheumatoid arthritis and osteo arthritis are well reviewed and practical treatments are advised. Gout is not discussed. Gonorrheal arthritis is given little space. The last two chapters, on physical therapy and on surgery, are written by other authors. They are both much too short to allow the subject to be well presented. The writers of these chapters have used different classifications than those used in the rest of the book and the selection and arrangement of their material is considerably below the standard of that set in the earlier chapters. The book gives an excellent review of recent advances in rheumatism and should be of particular value to physicians interested in the rheumatic diseases.

**Diseases of the Ear Throat and Nose** By J Douglas McLaggan  
MA MB FRCS Surgeon in Charge of the Ear Nose and Throat Department Royal Free Hospital London  
Cloth Price 15s Pp 338 with 144 illustrations London H K Lewis & Co Ltd 1937

Books of this character written for the general practitioner and medical student are frequently disappointing. Generally they are small, but their size is no indication of conciseness. Their lack of bulk is frequently an attempt to keep the cost down. Catering, as he does, to the tastes of a special group, the author frequently attempts to give the reader what he thinks the reader wants. The result is a lack of emphasis on the disagreeable, such as anatomy and physiology, and a great deal of

emphasis on the technic of operative procedures, many of which the reader in question is unqualified to do. Should he wish to do them his training of course, would have to be obtained in a far different way than by reading. This book is, however, an agreeable surprise. It is truly concise. There are a good many illustrations which are clear and to the point and there is no space wasted on difficult operations that the reader has no right to do. The common ailments are clearly described and the impression one gets is that here is an author whose descriptions of diseases comes from his own experience.

**The Endocrines in Theory and Practice.** Articles republished from the *British Medical Journal*. Cloth. Price 9s. \$3.50. Pp. 278 with illustrations. London: H. K. Lewis & Co. Ltd. Philadelphia: P. Blakiston's Son & Co. Inc. 1937.

These twenty-eight articles, by twenty-four authors, appeared serially in the *British Medical Journal* and are here reproduced in their original form. The treatment of the various subjects is of course uneven and, unfortunately, little attempt has apparently been made to integrate the articles into a uniform whole as a comprehensive treatise. Each section is therefore a separate entity. Despite these shortcomings, the first of which is inherent in any symposium, this collection of papers is a valuable one. Many of the authors are well known experts in their fields and a number of the reviews are of unusual excellence. Emphasis has been placed chiefly on clinical applications of endocrinology and in general the authors are commendably conservative in their views. F. C. Dodds, R. I. Noble, S. Levy Simpson, Sir Walter Langdon-Brown, Otto Leyton, J. H. Biggart and N. M. Dott write on various aspects of pituitary physiology and pathology, F. E. A. Crew contributes a section on pregnancy tests, C. R. Harrington, Sir Robert McCarrison, F. R. Fraser, Sir Thomas Dunhill, H. Gudmer-Hill and D. Murray Lyon consider the thyroid. S. Levy Simpson and A. W. Spence cover the adrenals. E. C. Dodds, J. M. Robson, T. N. A. Jeffcote and P. M. F. Bishop devote sections to the female reproductive apparatus and its endocrine principles, R. K. Callow, A. S. Parkes and K. M. Walker do likewise for the male. Samson Wright covers the thymus and pineal, Donald Hunter the parathyroids, Sir Walter Langdon-Brown and Sir Humphry Rolleston, respectively open and close the series with general articles. Unfortunately the symposium is not complete, for some unexplained reason sections devoted to principles of the pancreas, gastro-intestinal tract and liver are not incorporated. With but few reservations with regard to not more than three or four of the articles included in this book, it may be recommended to those who desire a brief and authoritative review of an important and fascinating subject.

**Physical Therapy in Arthritis.** By Frank Hammond Krusen, M.D., Associate Professor of Physical Medicine, The Mayo Foundation, University of Minnesota. Foreword by Melvin S. Henderson. Cloth. Price \$2.25. Pp. 180 with 21 illustrations. New York: Paul B. Hoeber, Inc. 1937.

This little book consisting of 120 pages of reading matter and sixty pages devoted to illustrations, references and index, is essentially a collection of excerpts from the recent American and English literature pertaining to the uses of physical therapy in the treatment of arthritis. For the most part as the author states in the preface, the text consists of direct quotations from the works reviewed. In many instances these quotations take up almost an entire chapter with but one or two paragraphs of comment by the author. It is disappointing that the book does not reflect the wide experience which the author must have had in his association with a large clinic and that he does not express his own opinions more frequently with reference to the efficacy of the various procedures. For instance, from page 21 to page 29 the full wet pack is described. The patient is stripped naked in a room the temperature of which is 68-72 F and wrapped in a sheet wrung out of water with a temperature of 60-70 F. Does the author believe that this is a useful measure in the treatment of chronic arthritis? Does he employ it in a more or less routine manner on his atrophic arthritis and/or his hypertrophic arthritis patients and has he been impressed by the improvement following its use? Since the author hopes that the book will serve as a means of aiding the general practitioner, the lack of such specific

information detracts much from its value. The book, however, is beautifully gotten up and as a review of the recent literature in the English language on physical therapy in arthritis it should prove useful to those who are interested in the subject.

**Plastique mammaire. Considérations médico-chirurgicales.** Par les Docteurs C. Cloué et Irène Bernard. Sciences. Paper. 1 p. 215, with 73 illustrations. Paris: Librairie Norbert Maloine S. A. 1936.

This monograph on mammary plastics is divided into four parts. Part I gives a historical survey of mammary esthetics throughout the ages, it also takes up the consideration of the relation of jurisprudence to reparatory mammary surgery and the risks taken by the operator. Part II deals with the necessity for and the indications which call for operation. The social, professional, pathologic and psychic aspects of deformed and hypertrophied breasts are discussed. Part III deals with the possibility of nonsurgical therapeutic curative measures for hypertrophied breasts. The authors evaluate local applications, compression, gymnastics and opotherapy. They point out the association of mammary gland disturbances with endocrine systemic imbalance and especially the influence of the hypophysis, placenta and ovaries. This section of the book is thorough. In part IV the various surgical plastic methods of correcting mammary deformities in the female are described, especially the methods developed in France. These include the procedures devised by Aubert, Dartigues, Hollander, Biesenberger, Schwarzmann, Cloué, Glisner, Noel and Pousson. These procedures are classed into two technical groups, namely, those in which the hypertrophied gland is resected without transposition of the nipple, and those in which following resection the nipple is transposed. All the technical details of each method are described. Particular mention is made of Cloué's personal method of mapping out and marking of the mammary region prior to undertaking reparatory surgery. The book is thoroughly illustrated and to the point. It is a complete exposition of all matters pertinent to esthetic surgery of the breast.

**The Rabbit Test for the Detection of Chorionic Tissue in the Body and the Determination of Its Proliferative Activity.** By S. B. Ankavard, M.D., Honorary Obstetrician & Gynaecologist, Sheth Vaidial Sarabhai General Hospital & Chinnai Maternity Home, Ahmedabad. With a foreword by Dr. J. M. D. Nayak. Cloth. Pp. 161 with 10 illustrations. Bombay: Fort Printing Press. London: H. K. Lewis & Co. Ltd. 1937.

The author has included in this book a great deal of material on tests for pregnancy both from his own experience and from the literature. Though it is written in a cumbersome style, contains many typographic errors and is poorly printed, it is nevertheless a valuable work. The many pregnancy tests proposed by different investigators are considered briefly with respect to their virtues and their deficiencies. Only the Friedman modification of the Aschheim-Zondek test survives the author's critical analysis as more nearly meeting the necessary qualifications of rapidity and reliability than any of the others. The major portion of this small volume is devoted to a detailed discussion of the theory and practice of the latter method. Various technical modifications are considered by the author. Included also are many practical pointers designed to facilitate execution of the test and to render its interpretation more reliable.

**The Roentgenologist in Court.** By Samuel Wright Donaldson, A.B., M.D., F.A.C.B., St. Joseph's Mercy Hospital, Ann Arbor. Cloth. Price \$1. Pp. 210. Springfield, Illinois & Baltimore: Charles C. Thomas, 1937.

Distasteful as are most matters of law to the average physician, contact with legal procedures is almost inevitable at some point in his career. Some knowledge of the law and its ramifications into the medical sphere is imperative. This small, readable book clarifies in a simple, authoritative manner many medicolegal problems of importance not only to the roentgenologist but to members of the medical profession at large. The legal obligations of the physician to the general public are discussed in some detail, with particular attention to the present opinions of the courts on the status of radiology as a medical specialty. The causes and methods of prevention for malpractice suits are well presented. There is a particularly good discussion of the legal responsibility incumbent on the practitioner to use the roentgen method of diagnosis in various



diseases. An increasing number of court rulings hold that x-ray diagnosis, in certain conditions, is an integral part of the standard, ordinary practice of medicine. A chapter on the vexatious question of the ownership of roentgenograms cites sufficient judicial opinion to indicate finally that roentgenograms remain the property of the physician or institution by whom they were taken. The largest portion of the book is devoted to expert testimony. The author cites numerous court decisions which tend to clarify the question of the qualifications of an expert in the interpretation of roentgenograms. The troublesome problem as to the obligation of the physician to give opinion or expert testimony on subpoena is settled, apparently to the disadvantage of the specialist. Roentgenograms are now commonly admitted as evidence by the courts, and the criteria for such admission is discussed. The author barely touches on the possibility of persuading the courts to rely entirely on expert interpretation, without demonstration of the films themselves, a most desirable improvement in procedure. Sound, astute advice for conduct on the witness stand is offered. A careful reading of this section would be of advantage to any physician expecting to testify. A review of the unfortunate aspects of expert testimony is of interest emphasizing the fact that this problem is not a recent one. The whole question should be reopened and some new method proposed before further harm is done the prestige of the profession by the apparent venality too often exhibited by expert medical witnesses. This informative volume is liberally supported by citations from the courts and represents a worthy contribution to medicolegal literature.

**Dental Histology and Comparative Dental Anatomy** By Rudolf Kronfeld BS MD DDS Professor of Dental Histology and Pathology in the Chicago College of Dental Surgery School of Dentistry Loyola University Chicago Cloth Price \$3.75 Pp 195 with 115 illustrations Philadelphia Lea & Febiger 1937

Because of the size of the type and spacing, the amount of text is even less than the size of the volume would indicate. The author explains this by saying "It has been my experience, both as a student and in teaching students, that most of the subject matter in histology is soon forgotten, not so much because of lack of interest as that the course is overloaded with names and terms, most of which have little meaning to the untrained mind. Therefore, it has been my intention to state the fundamentals as briefly and as clearly as possible in the hope that they may thus be more easily remembered." This goal has been attained the numerous excellent illustrations, most of them photographs, assisting materially. At the close of each chapter are placed suggestions for the laboratory exercises, there is a short glossary of terms and proper names, there are questions on the text, and an adequate bibliography for collateral reading. There is an occasional questionable statement, as the one on page 43 "For no known reason, most of the dentin in older teeth is usually of irregular structure."

**Leprosy A Problem of Colonial Development** Report for 1936 of the British Empire Leprosy Relief Association Working in Co Operation With WHO Paper Pp 32 with illustrations London The Association [n d]

Founded in 1924 this association works in British colonies protectorates and dependencies of the empire, within which it is estimated that there are 2,000,000 lepers. The incidence varies from 1 per cent in Nigeria to 30 per cent in Nauru (in 1924) and surveys seem invariably to reveal unexpectedly higher incidences. There are 100 cases in England mostly acquired abroad and the disease is not even notifiable there. The aims of the association are mainly educational, using special medical directors to establish centers for segregation of victims in countries of low economic and sanitary standards. All too often these refuges have been filled with old cases, no longer infectious. The association seeks by education and local organization to segregate the earlier and more infectious stages from the community and especially from young children and thus to reduce the incidence. Tribal and clan cooperation together with local support and some degree of economic independence on the part of the leper colony is the plan most favored. To these ends special instruction under medical supervision by lay and native helpers has been or is being organized in all parts of the British empire where this dread disease occurs. This report gives the details of this work of founding leproseries.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts Chiropractic Adjustments as Medical Care**—The Utah workmen's compensation act requires an employer to pay "such a reasonable sum for medical, nurse and hospital services, and for medicines as may be necessary to relieve a workman from industrial injuries, within limits not here material. The workman in this case, Shober, sustained an injury to his back and was treated by a chiropractor. The industrial commission disallowed Shober's claim for the expense of the chiropractic services on the ground that such services were not "medical services" within the meaning of the compensation act. This disallowance constituted the sole basis for the present appeal to the Supreme Court of Utah.

Chiropractic, said the Supreme Court, is defined by law in Utah as "palpating and adjusting the articulation of the spinal column by the hands only." In the vernacular of the layman, it consists of examining the spine of a patient to determine if a vertebra is displaced or out of alignment and of pressing on such vertebra, with the hands only, to force it back into its proper position. Such practice constitutes the practice of medicine in Utah. *Board of Medical Examiners v. Freenor*, 47 Utah 430, 154 P 941, Annotated Cases 1917E, 1156, *State v. Erickson*, 47 Utah 452, 154 P 948. Counsel for the commission contended, however, that, since chiropractors were not licensed to practice in Utah in 1917, the year the workmen's compensation act was enacted, chiropractic could not have been included within the term "medical service" as used by the legislature in that act. But, answered the Supreme Court, the legislature had in mind when it used the term "medical services" such services as are rendered by a person licensed to practice medicine within the state and it must have had in mind the Freenor and Erickson cases, decided in 1916, holding that chiropractic was the practice of medicine. Although a chiropractor does not use medicines or perform surgical operations, he does treat and operate on patients for physical ailments and but for his license would be liable to the penalty prescribed for practicing medicine without a license. The term "medicine" is not limited to curative or remedial substances, it also means the healing art, the science of preserving health and treating disease for the purpose of cure, whether such treatment involves the use of medical substances or not.

The services rendered by the chiropractor in this case, the court concluded, constituted the practice of medicine as defined by the medical practice act, were therefore medical services, were rendered by a person licensed to practice within that field, and should therefore have been allowed by the commission. The cause was remanded to the industrial commission—*Shober v. Industrial Commission (Utah)*, 68 P (2d) 756.

**Dental Practice Acts Minnesota Law Imposing Advertising Restrictions Construed**—Prior to 1935 the plaintiffs had practiced dentistry under the name of the Nicollet Dental Clinic. Thereafter, because an amendment to the dental practice act prohibited the use of a corporate or trade name for dental practitioners associated together, they advertised themselves as "Dr. Gullings and Associates—Dentists. Successors to Nicollet Dental Clinic," and listed the name of each dentist in the group. Three of the dentists were advertised as "Specializing in Plates and Extractions." On being advised by the attorney general that their advertisement violated the dental practice act they sought a construction of that act in an action in the district court of Ramsey County, Minn., under the declaratory judgment act. From an adverse judgment they appealed to the Supreme Court of Minnesota.

The issue before the court was whether that part of the advertisement naming the three dentists as specializing in plates and extractions constituted a violation of the dental practice act. After outlawing all advertising by dentists, said the court, the



act, by a proviso, permits a dentist to announce or print certain specified information "and if he limits his practice to a specialty he may announce it." The plaintiffs contended that this proviso authorized the advertisement that precipitated the controversy. All the plaintiffs, observed the court, were in the employ of a Dr. Gullings. Patients first entering the office were examined by him and directed to one of his associates for treatment. Each dentist was paid a salary in the form of a commission based on the amount of work each did. The relationship between Dr. Gullings and the other dentists was that of employer-employee. The three dentists named specially in the advertisement did specialize in plates and extractions but the other dentists engaged in a general practice. In the opinion of the court there was but one practice and one business being conducted by the plaintiffs and that practice was not a specialized one. It could hardly be claimed, said the court, that a dentist engaged in practice alone may have a general practice and also specialize in some branch of his profession and may not so announce, because his practice is not limited to a specialty, but that a group of dentists may associate themselves together and carry on a practice in which some of the members engaged in specialized work and the remainder in general practice, and that they may announce the fact that part of their practice is devoted to a specialty. The obvious intent of the legislature was otherwise. The advertisement, therefore, was declared to be of a type proscribed by the legislature and the judgment of the lower court was affirmed—*Gullings v. State Board of Dental Examiners (Minn.)*, 273 N. W. 703.

**Workmen's Compensation Acts Cerebral Hemorrhage in Relation to Arteriosclerosis and Strain**—Morris, a well-driller, was arteriosclerotic. During the course of his employment he was subjected to a severe strain and collapsed. He died several hours afterward. The industrial accident board of Texas awarded his widow compensation but the district court set aside the award. The widow then appealed to the court of civil appeals of Texas, El Paso.

The physician who attended Morris testified that the strain and exertion of Morris's work at the time he was stricken contributed to and caused the cerebral hemorrhage from the effects of which he died. The ruptured blood vessel in Morris's brain said the court accelerated or caused by the exertion and strain of the work in which he was engaged at the time he was stricken, constituted an accidental injury within the purview of the compensation act of Texas and was compensable. The court thought it to be immaterial that Morris had a pre-existing arteriosclerosis which rendered him more susceptible to a cerebral hemorrhage than an ordinary healthy person. The judgment of the district court denying the widow compensation was reversed and the cause remanded—*Hurd v. Republic Underwriters (Texas)*, 105 S. W. (2d) 428.

**Optometry Right of Corporation to Practice**—In the opinion of the Supreme Court of Arkansas, the Arkansas optometry practice act does not prohibit a corporation from practicing optometry through the agency of persons who are duly licensed to practice. Optometry, said the court, is not a learned profession but is a mechanical one requiring skill, manual dexterity and knowledge of the use and application of certain mechanical instruments. Its nature is empirical rather than learned. To designate optometry as a profession, as the Arkansas optometry practice act does, does not imply that it is a learned profession and there is no public policy forbidding commercialization of optometry as there is in law and medicine, which are true learned professions.

The Arkansas optometry practice act was passed because the legislature believed it an aid to public health. The benefit was intended for the public and not for optometrists. This being the case, there can be no argument that the public health would be conserved by the services of an optometrist working for himself and not by one working for another. The Supreme Court accordingly denied an injunction sought by the state on the relation of the attorney general, to prohibit the defendant corporation from practicing optometry—*State ex rel Atty. Gen. v. Gus Blass Co. (Ark.)* 105 S. W. (2d) 833.

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of, Mobile Apr 19 21 Dr D L Cannon 519 Dexter Ave Montgomery Secretary
- American Association for Thoracic Surgery Atlanta Ga, Apr 4 6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary
- American Association of Anatomists, Pittsburgh Apr 14 16 Dr George W Corner 260 Crittenden Bldg, Rochester N Y Secretary
- American Association of Genito Urinary Surgeons Atlantic City N J May 24 Dr Henry L Sanford, 1621 Euclid Ave Cleveland Secretary
- American Association of Pathologists and Bacteriologists Atlantic City N J May 3 4 Dr Howard T Karsner 2085 Adelbert Road Cleveland Secretary
- American Association of the History of Medicine Atlantic City N J May 2 Dr E J G Beardsley, 1919 Spruce St Philadelphia Secretary
- American Association on Mental Deficiency Richmond Va Apr 20-23 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary
- American Bronchoscopic Society Atlantic City N J Apr 30 Dr Lyman Richards 319 Longwood Ave Boston Secretary
- American College of Physicians New York Apr 4 8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary
- American Gastro Enterological Association Atlantic City N J May 23 Dr Russell S Boles, 1901 Walnut St Philadelphia, Secretary
- American Laryngological Association Atlantic City N J May 2-4 Dr James A Babbitt 1912 Spruce St Philadelphia Secretary
- American Laryngological Rhinological and Otolological Society Atlantic City N J Apr 27 29 Dr C Stewart Nash 277 Alexander St Rochester N Y Secretary
- American Neurological Association Atlantic City N J May 2 6 Dr Henry A Ryley 117 East 72d St New York Secretary
- American Orthopedic Association Atlantic City N J May 3 5 Dr Ralph K Ghormley 110 Second Ave S W, Rochester Minn, Secretary
- American Physiological Society Baltimore Mar 30 Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary
- American Society for Clinical Investigation Atlantic City N J May 2 Dr J M Hayman Jr 2065 Adelbert Road Cleveland Secretary
- American Society for Experimental Pathology Baltimore Mar 30 Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary
- American Society for Pharmacology and Experimental Therapeutics Baltimore Mar 30 Apr 2 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary
- American Society of Biological Chemists Baltimore Mar 30 Apr 2 Dr H A Mattill Chemistry Bldg State University of Iowa Iowa City Secretary
- American Surgical Association, Atlantic City N J May 2 4 Dr Charles G Mixer 319 Longwood Ave Boston Secretary
- American Therapeutic Society New York Apr 1 2 Dr Oscar B Hunter 1835 Eye St N W Washington D C, Secretary
- Arizona State Medical Association Tucson Apr 21 23 Dr D F Harbridge 15 East Monroe St Phoenix Secretary
- Arkansas Medical Society Texarkana Apr 18 20 Dr W R Brooksher 602 Garrison Ave Ft Smith, Secretary
- Association of American Physicians Atlantic City N J May 3 5 Dr Hugh J Morgan Vanderbilt University Hospital Nashville Tenn Secretary
- California Medical Association Pasadena May 9 12 Dr F C Warnshus 450 Sutter Street San Francisco Secretary
- Conference of State and Provincial Health Authorities of North America Washington D C Apr 9 11 Dr A J Chesley, Minnesota State Office Bldg St Paul Secretary
- Congress of American Physicians and Surgeons Atlantic City N J May 3 4 Dr John T King Jr 1210 Eutaw Place Baltimore Secretary
- District of Columbia Medical Society of the Washington May 4 5 Dr C B Conklin 1718 M St N W Washington Secretary
- Federation of American Societies for Experimental Biology Baltimore March 30 April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
- Florida Medical Association Miami May 9 11 Dr Shaler Richardson 111 W Adams St Jacksonville Secretary
- Georgia Medical Association of Augusta Apr 26 29 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary
- Iowa State Medical Society Des Moines May 11 13 Dr Robert I Parker 3510 Sixth Ave Des Moines Secretary
- Kansas Medical Society Wichita May 9 12 Mr C G Munns 112 West Sixth St Topeka, Executive Secretary
- Louisiana State Medical Society New Orleans May 2 4 Dr P T Talbot 1430 Tulane Ave New Orleans Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore Apr 26 27 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary
- Mississippi State Medical Association Jackson Apr 19 21 Dr T M Dye McWilliams Bldg Clarkdale Secretary
- Missouri State Medical Association Jefferson City May 2 4 Dr F J Goodwin 634 N Grand Blvd St Louis Secretary
- Nebraska State Medical Association Lincoln Apr 26 28 Dr R B Adams Center McKinley Bldg Lincoln Secretary
- New York Medical Society of the State of New York May 9 12 Dr Peter Irving 2 East 103d St New York Secretary
- North Carolina Medical Society of the State of Pinehurst May 2 4 Dr T W M Long Roanoke Rapids Secretary
- Ohio State Medical Association Columbus May 11 12 Mr C S Nelson 79 East State St Columbus Executive Secretary
- Oklahoma State Medical Association Muskogee May 9 11 Dr L S Willour Third and Seminole McAlester Secretary
- Philippine Islands Medical Association Zamboanga City Apr 19 21 Dr A S Fernando 817 Taft Ave Manila Secretary
- Society for the Study of Asthma and Allied Conditions Atlantic City N J Apr 30 Dr W C Spain 116 East 53d St New York Secretary
- South Dakota State Medical Association Huron May 9 11 Dr Clarence E Sherwood 1025 Egan Ave S Madison Secretary
- Tennessee State Medical Association Nashville Apr 12 14 Dr H H Shoulders 706 Church St Nashville Secretary
- Texas State Medical Association of Galveston May 9 12 Dr Holman Taylor 1404 West El Paso St Fort Worth Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Heart Journal, St Louis

15 1128 (Jan) 1938

- Significance of Rheumatic Activity in Chronic Rheumatic Heart Disease  
Part I Intensity and Extent I R Juster Glens Falls N Y—  
p 1
- Precipitating Causes of Congestive Heart Failure W A Sodeman and  
C E Burch New Orleans—p 22
- \*Relation of Myocardial Disease to Abnormalities of Ventricular Complex  
of Electrocardiogram H E B Pardee and L Price New York—  
p 28
- Observations on Cardio Accelerator Reflex from Stimulation of Skin  
Temperature Receptors S Benson Chicago—p 45
- Calcified Nodular Deformity of Aortic Valve B J Clawson J F  
Noble and N H Lufkin Minneapolis—p 58
- Influence of Size of Cardiac Infarcts on Electrocardiogram H Gold  
W Modell and Janet Travell New York—p 77
- Respiratory Changes Produced in Cardiac Patient by Rebreathing Experi-  
ments as Compared with Those of Normal Individual H Landt and  
J E Benjamin Cincinnati—p 83
- \*Electrocardiographic Changes Following Inhalation of Tobacco Smoke  
A Graybiel Boston R S Starr Hartford Conn and P D White  
Boston—p 89
- Electrical Alternans Occurring in Case with Pericardial Effusion  
L Feldman Chicago—p 100

**Myocardial Disease and Abnormalities of Ventricular Complex**—To determine the reliability of electrocardiographic evidence in diagnosing morphologic changes in the ventricular myocardium, Pardee and Price review sixty cases in which electrocardiographic records were made shortly before death and neither digitalis nor quinidine had been administered recently enough to influence the record. In seven of thirteen cases in which the ventricular complex was normal, a normal myocardium was found. In the other six there were slight morphologic changes. In nine of forty-seven cases in which the ventricular complexes were abnormal, a normal myocardium was found. The abnormal features of the electrocardiograms in these nine cases were similar to those found in other cases in which slight or moderate pathologic changes existed in the myocardium. In the other cases in which the ventricular complexes were abnormal there were definite myocardial changes. When the electrocardiographic abnormality involved only the QRS group, the T wave being normal, there were found only slight or moderate myocardial changes. When the T wave was abnormal with or without QRS abnormality, there was a great range in the extent and the degree of the myocardial changes discovered. A frequent but not constant association was seen between the coronary T wave and focal myocardial lesions. There was a constant association between an elevated or depressed ST interval and the finding of areas of acute myocardial degeneration, though not always with areas of infarction. Right bundle branch block occurred twice without morphologic myocardial changes being discovered and three times with such changes. Left bundle branch block occurred twice, each time associated with myocardial changes.

**Electrocardiographic Changes and Inhalation of Tobacco Smoke**—Their interest in the effect of tobacco on the electrocardiogram was stimulated by observations on a healthy young man 18 years of age who complained of dizziness on smoking. Electrocardiograms taken after the inhalation of tobacco smoke showed well marked inversion of the T waves in leads 2 and 3 while at other times the T waves were upright and of normal amplitude. To determine whether or not this is a common phenomenon Graybiel and his collaborators carried out similar tests on forty-five persons of varying ages, some with heart disease, during the inhalation

of tobacco smoke. Thirty-nine of the forty-five patients exhibited on smoking an increase in cardiac rate which averaged thirteen a minute, twenty-four of thirty-one tested showed an increase in arterial blood pressure which averaged 13 mm of mercury systolic and 7 mm diastolic. Lowering or inversion of the T waves occurred during the test in fifteen. The probable explanation for the changes in the T wave lies in the characteristic action of nicotine on the cardiac ganglions. Actually the changes in the T wave following smoking were found to be similar to those following atropinization. It is suggested that in those occasional instances in which attacks of angina pectoris are precipitated by smoking (tobacco angina) the attacks are not the result of coronary vasoconstriction but of a sudden increase in the work of the heart as shown by the increase in blood pressure or cardiac rate, or both.

### American Journal of Anatomy, Philadelphia

62 179 312 (Jan) 1938

- Studies of Living Muscles I Growth Injury and Repair of Striated  
Muscle as Revealed by Prolonged Observations of Individual Fibers  
in Living Frog Tadpoles C C Speidel Charlottesville Va—p 179
- Variations Produced in Bones of Growing Rats by Parathyroid Extracts  
R B Burrows New Haven Conn—p 237
- Length of Organ of Corti in Man Mary Hardy Baltimore—p 291

### American Journal of Cancer, New York

32 1162 (Jan) 1938

- Arrhenoblastoma Malignant Ovarian Tumor Associated with Endo-  
crinologic Effects E H Norris Minneapolis—p 1
- Bacteriologic Study of Mouse Tumors II Bacterial Immunity and  
Tumor Growth Effect of Bacterial Products on Tumors M J  
Eisen Milan Italy—p 30
- Immunity Reactions of Heterotransplantable Mouse Carcinoma Propa-  
gated in Rats for Seven Years J Putnok Budapest Hungary—  
p 35
- Relation of Hypophysectomy to Growth of Malignant Tumors IV Study of  
Influence of Nutritional Factors on Walker Tumor 256 in Relation to  
Effect of Hypophysectomy H A Ball and L T Samuels San  
Diego Calif—p 50
- \*Incidence of Metastasis of Malignant Tumors to Adrenals D A  
Glomset Chicago—p 57
- Chemical Studies on Tumor Tissue VI Comparative Effects of Serum  
Colloids and of Salts on Swelling of Mouse Tumor Cells in Vitro  
M Belkin and M J Shear Boston—p 62
- Production of Epithelial Tumors by Combination of Beta Radiation and  
Painting with Benzpyrene J C Mottram London England—p 76
- Incidence of Spontaneous Tumors of Mice of CBA Strain After Change  
of Diet Preliminary Report L C Strong New Haven Conn—  
p 80
- Incidence of Spontaneous Tumors in Female Mice (Breeders) of the  
CBA Strain L C Strong New Haven Conn—p 85
- Study of Growth of Cysticercus Sarcocysts 4337 and 4338 from Grafts  
of Each Tumor Simultaneously Transplanted in Subcutaneous Tissues  
of Same Hosts W F Dunning M R Curtis and F D Bullock  
New York—p 90
- Uterine Cancer in the Rabbit J W Orr and C J Polson Leeds,  
England—p 114
- Effect of Extracts of Different Organs and Tissues on Viability of Trans-  
plantable Tumors K Sugiura New York—p 126

**Incidence of Metastasis to Adrenals**—Glomset compares the relative susceptibility of the adrenals to metastases with other organs having a similar blood supply. His material consists of 4,000 consecutive necropsies performed by the staff of the Department of Pathology of the University of Chicago up to and including 1936. Of the 4,000 necropsies, 821 showed evidence of malignant neoplastic growth and in 445 of these there were organic metastases. In 275 cases (34 per cent of all malignant tumors) there was metastasis to the liver. Forty-six per cent of these metastases, however, came from tumors the primary site of which was in the portal area. In addition, metastasis to the lung occurred in 224 cases, to the adrenals in 110 cases, to the kidneys in forty-nine cases and to the spleen in thirty. Although the kidneys, spleen and adrenals are situated close together and have a similar blood supply, the adrenals have more metastases than either the spleen or the kidneys despite their much smaller size. Of all organically metastasizing tumors, 247 per cent metastasized to the adrenals. The high incidence of tumors which metastasize to the adrenals that have their primary site in the lung and breast, or in a malignant melanoblastoma leads one to surmise that most adrenal metastases are blood borne. These figures are in accord with those of Willis, which show that adrenal

metastases are most commonly bilateral but, when unilateral, are more prevalent in the left than in the right gland. Tumors which only occasionally metastasize to the adrenals are those of the gastro-intestinal tract and the pelvic organs.

### American J Digest Dis & Nutrition, Fort Wayne, Ind

4 705 786 (Jan) 1938

- Ulcer Recurrences Attributed to Upper Respiratory Tract Infection Possible Illustration of Schwartzman Phenomenon B B Crohn and G Schwartzman New York—p 705
- Studies in Mucous Membrane Hypersensitiveness III Allergic Reaction of Passively Sensitized Rectal Mucous Membrane I Gray and M Walzer Brooklyn—p 707
- Secondary Effects of Radiation on Rectum Following Treatment of Extrarectal Pelvic Lesions L K Ferguson Philadelphia—p 712
- Deficiency States Associated with Gastrointestinal Disease D L Wilbur and A M Snell Rochester Minn—p 720
- Diarrhea of Pancreatic Insufficiency J A Birgen J L Bollman and E J Kepler Rochester Minn—p 728
- Diagnosis and Treatment of Acute Nonhemorrhagic Pancreatitis R Elman St Louis—p 732
- \*Back Pain in Lesions of Gastro-Intestinal Tract with Particular Reference to Duodenal Ulcer W J Mixer Boston—p 736
- Acute Abdominal Pain from Upper Urinary Tract Lesions A Randall and B Hughes Philadelphia—p 739
- Intubation Studies of Human Small Intestine VII Factors Concerned in Absorption of Glucose from Jejunum and Ileum W O Abbott W G Karr and T G Miller, Philadelphia—p 742
- Deposition of Glycogen in Normal and in Experimentally Damaged Livers After Oral and Intravenous Administration of Dextrose T L Althausen with technical assistance of M Stockholm San Francisco—p 752

**Back Pain in Lesions of Gastro-Intestinal Tract** — Mixer reports seven cases of duodenal ulcer in which the main symptom was pain in the back with little or nothing that would suggest a lesion of the duodenum. Pain in the back or pain radiating about the chest may be the only sign in duodenal ulcer, even in extensive perforating ulcer of the posterior wall of the duodenum.

### American Journal of Ophthalmology, St Louis

21 1 120 (Jan) 1938

- Return of Vision and Other Observations in Grafted Vertebrate Eyes I S Stone New Haven Conn—p 1
- Indirect Traumatic Optic Atrophies M Davidson New York—p 7
- Clinical Significance of Retinal Changes in Hypertensive Toxemias of Pregnancy G G Gibson Philadelphia—p 22
- Leukemic Infiltration of Retina and Choroid in an Infant Treated by X-Ray B Y Alvis St Louis—p 31
- Experimental Studies of Effect on Retinal Blood Pressure and Intraocular Tension of Pressure Applied to Eyeball E L Bulson Fort Wayne Ind—p 34
- Keratoconus Report of Five Cases W M Dodge Jr Battle Creek Mich—p 40
- \*Sulfanilamide in Ophthalmology Report of Case M Goldenburg Chicago—p 34

**Sulfanilamide in Ophthalmology** — Goldenburg saw a virulent case of orbital cellulitis, apparently of metastatic origin. Because of the history elicited and the clinical picture presented he concurred in the continuation of the use of sulfanilamide and even when the patient showed moderate cyanosis urged an increase in its administration. The outcome was favorable. The primary lesion (a pimple) was on the left side of the face, followed by parotitis of the right side, which became marked, and although parotitis also developed later on the left side, it was comparatively moderate. This was followed by edema of the lids and proptosis of the right eye, which became very marked. The chemosis of the conjunctiva during the height of the proptosis was moderate, but as the lids became less taut the bulbar conjunctiva increased in chemosis which, however, did not persist very long. The fundus of the right eye when first seen was peculiar in that the disk appeared paler than normal, and later as the proptosis decreased it became redder and at a still later date intensely red. The papilledema of the left eye, at first only moderate increased as the patient apparently improved reaching a height of about 4 diopters and disappearing slowly. At no time was the left eye involved externally. Complete muscular function returned in the right eye with the exception of a barely noticeable ptosis of the upper lid. The patient states that he sees as well as usual. Although the author disagreed with the consultants in the diagnosis and the patient made an excellent recovery, it is not beyond the sphere of possibility that they

were correct and that the case was one of those rare instances of cavernous sinus thrombosis in which recovery does occur. This might be attributed to the action of the sulfanilamide. Although the patient became mildly cyanotic, it was presumed that this condition was due to the medication, but in view of the lack of evidence of pathologic changes of the erythrocytes the drug was pushed further and the cyanosis soon disappeared.

### American Journal of Physiology, Baltimore

121 1 310 (Jan) 1938 Partial Index

- Chemoreflex Control of Vascular Reactions Through Carotid Body T Bernthal Ann Arbor Mich—p 1
- Response of Sensorimotor Cortex to Stimulation of Peripheral Nerve S H Bartley and P Heinbecker St Louis—p 21
- Reflex Responses of Nictitating Membrane and Blood Pressure to Distention of Bladder and Rectum A L Watkins Boston—p 32
- Time Relations of Response to Repeated Water Ingestion H L White St Louis—p 40
- Some Effects of Zinc and Iron Salts on Hypoglycemic Action of Insulin in Rats N R Blatherwick Mary E Ewing and Phoebe J Bradshaw New York—p 44
- \*Total Urinary Estrogen Estrone and Estrinol During Menstrual Cycle and Pregnancy G Van S Smith O W Smith and G Pincus Brookline Mass—p 98
- Muscular Efficiency in Relation to Taking of Food and to Height of Respiratory Quotient Immediately Before Exercise J Hald J G Bachmann C Ensor and W Wynn Emory University Ga—p 123
- Study of Mechanism Whereby Coitus Excites Ovulation Producing Activity of Rabbit's Pituitary C M Brooks Baltimore—p 157
- Increased Sodium Chloride Appetite in Pregnant Rats B Barela Jr and C P Richter Baltimore—p 185
- Adrenals and Gonads of Rats Following Thyroidectomy Considered in Relation to Pituitary Histology Isolde T Zeckwer Philadelphia—p 224
- Study of Protein Anabolism and Catabolism on Nitrogen Free Diet W H Seegers Yellow Springs Ohio—p 231
- Some Effects of Acute Anemia on Transmission of Impulses Through Sympathetic Ganglion D Bargeton Boston—p 261
- Existence of Secretory Nerves in Vagi for and Reflex Excitation and Inhibition of Bile Secretion C A Tanturi and A C Ivy Chicago—p 270
- Factors Influencing Concentrations of Serum Protein Chloride and Total Fixed Base of Dog During Exercise F W Schlutz and Minerva Morse Chicago—p 293

**Urinary Estrogens During Menstrual Cycle** — The Smiths and Pincus comment on the 'total' estrogenic potency of urine collected through a menstrual cycle and a pregnancy in a woman aged 27. This has been quantitatively measured by bio assay after the use of two different methods of hydrolysis and extraction. The two techniques yielded similar curves for 'total' estrogen throughout the menstrual cycle, the Cohen and Marrian, however, giving significantly higher values during the latter half than the method of the Smiths. Similar curves for 'total' estrogens were also found by both methods during gestation. In 60 per cent of the pregnancy urines, however, the technic of the Smiths gave significantly higher values than those resulting from the technic of Cohen and Marrian. This difference was demonstrated to be due to the chance for loss in the Cohen and Marrian extraction and separation of theelin and theelol in pregnancy urines. The separation of theelin and theelol in the menstrual cycle revealed that (1) more theelin than theelol was present throughout, (2) more theelol was excreted during the luteal phase than during menstruation and the period of follicle ripening, (3) a rise in theelin accompanied the onset of menstruation and (4) the theelin to theelol ratio was twice as high during the first two days of both catamenias followed as at any other time. The separation of theelin and theelol through pregnancy revealed that (1) the only specimen which contained more activity in the theelin than in the theelol fraction was collected at the time of the second missed catamenia when the patient had been put to bed for flowing, (2) theelol was in the ascendancy for the rest of the pregnancy, its rate of increase being greater than that of theelin to the last month, (3) false labor twelve days before delivery was accompanied by a marked rise in both theelin and theelol, the ratio of the two remaining unchanged and (4) labor and delivery were accompanied by a drop in theelol and a rise in theelin so that the ratio of theelol to theelin was lower than it had been at any time since the second month. Comparison of colorimetric with bio assay on the pregnancy urine from the fourth month on suggested the presence of some estrogen in addition to theelin and theelol and more active than either (estradiol).

# Am. J Syphilis, Gonorrhea and Ven Dis, St Louis

22 1132 (Jan) 1938

- Effect of Sulfanilamide on Gonococci Experimental Study A Cohn New York—p 1
- \*Effect of Administration of Theelin on Course of Experimental Rabbit Syphilis J E Kemp and C Shaw with technical assistance of Elsie Mae Fitzgerald Chicago—p 9
- Micromodification of Eagle Flocculation Technic H Eagle Baltimore and A F Brand Fayetteville N Y—p 22
- Evaluation of Complement Fixation Test for Gonorrhea A Jacoby M Wishengrad and J Koopman New York—p 32
- Fever Therapy in Gonococcal Infections with Especial Reference to Gonococcal Arthritis T G Schnabel and F Fetter Philadelphia—p 39
- Fever Therapy in Gonococcal Infections J A Trautman H V Stroupe and D J Devlin New Orleans—p 48
- Comparison of Results of Smear and Cultural Methods for Diagnosis of Gonococcal Infections in Adult Females C M Carpenter Alice D Leahy and K M Wilson Rochester, N Y—p 55
- Multiple Test Method for Routine Use in Serodiagnosis of Syphilis Report of 7 091 Tests Performed on 3 000 Consecutive Blood Specimens L F Pierce H A Patterson Rose A Stevenson and H C Torbert Los Angeles—p 59
- \*Treatment of Syphilis in Tuberculous Patients Preliminary Report C R Smith Northville Mich—p 72
- Early Treatment of Acquired Syphilis E Hoffmann Bonn/Rh Germany—p 82

**Administration of Theelin in Experimental Syphilis.**—Kemp and his associates compared the course of experimental syphilis in twelve male rabbits treated with theelin, twelve normal males used as controls, thirteen female animals treated with theelin and fourteen normal females used as controls All the animals were inoculated on granulating wounds on the back twelve to fifteen days old by massaging into them 0.15 cc of an emulsion of a testicular syphiloma containing from three to five spirochetes per high power darkfield The animals were observed for an average of 157 days after inoculation and thirty-five days after treatment ended The administration of theelin in amounts sufficient to keep female rabbits in continual estrus modified the course of the syphilitic infection in male rabbits until its severity approached the severity of the infection in normal female rabbits The comparatively milder course of the infection in female than in male rabbits was modified still further by the administration of theelin In female rabbits the beneficial effects of theelin on the course of the syphilitic infection was more apparent than it was in male animals treated with theelin These observations and those of Frazier suggest that the estrogenic substance might be one of the factors responsible for the modified course of the syphilitic infection in the pregnant and its milder course in the nonpregnant female

**Treatment of Syphilis in Tuberculous Patients.**—Smith comments on the results of 2,776 antisyphilitic treatments as related to pulmonary tuberculosis given to sixty-nine tuberculous patients The patients received one or more drugs, principally bismuth arsphenamine sulfonate, neoarsphenamine, mapharsen and sodium bismuth thioglycolate In most of the earlier patients of the group the treatment of syphilis was intentionally inadequate because of the fear that tuberculosis would be made worse The dose has been gradually increased, and the later treatment may be considered adequate The results show that progressive tuberculosis is not more frequent in the treated syphilitic patients than in similar groups of nonsyphilitic tuberculous patients and that treatment of syphilis lessens the frequency of progressive tuberculosis The results justify adequate treatment of syphilis in tuberculous patients

## Annals of Medical History, New York

10 1106 (Jan) 1938

- Hunter Holmes McGuire S McGuire Richmond Va—p 1
- George Ben Johnston J M Hutcheson Richmond Va—p 15
- Cesarean Section in Virginia in the Preaseptic Era 1794-1879 J L Miller Thomas W Va—p 23
- Dr John Peter Vettauer An Early Southern Gynecologist P Rucker Richmond Va—p 6
- Thomas Jeffer on s Influence on the Foundation of Medical Instruction at the University of Virginia A D Hart Jr University Va—p 47
- Pioneer Medicine in Virginia B P Seward Roanoke Va—p 61
- The Scotch Irish of the Valley of Virginia and Their Influence on Medical Progress in America H H Trout Roanoke Va—p 71
- Medicine and Shockoe Hill H J Warthen Richmond Va—p 83
- Development of Psychiatry and Neurology in Virginia B R Tucker Richmond Va—p 91

# Archives of Neurology and Psychiatry, Chicago

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- Sakel's Pharmacologic Shock Treatment for Schizophrenia Tentative Directions and System of Recording J P Frostig Warsaw Poland, translated by J Wortis New York—p 219
- \*Protamine Zinc Insulin Its Unsuitability for Hypoglycemic Shock Therapy H H Reese Madison Wis, and A Vander Veer Chicago—p 232
- Hypoglycemia Neurologic and Neuropathologic Studies F P Moersch and J W Kernohan Rochester Minn—p 242
- Results of Treatment of Athetosis by Section of Extrapyramidal Tracts in Spinal Cord T J Putnam Boston—p 258
- Oxygen and Carbon Dioxide Contents of Arterial and Venous Blood of Schizophrenic Patients J M Looney and H Freeman, Worcester, Mass—p 276
- Lipoid Content of Blood in Deficiency Diseases and During Demyelination of Nervous System E F Gildea New Haven Conn—p 284
- \*Cerebral Dysrhythmias of Epilepsy Measures for Their Control F A Gibbs E L Gibbs and W G Lennox Boston—p 298
- \*Neural Correlations of Vision and Their Significance for Localization of Tumors of the Brain Preliminary Report C A Elsberg and H Spatz New York—p 315
- Contribution to Problem of Cutaneous Localization in Man E Gellhorn J Mehlman and M Kaplan Chicago—p 327
- Prepsychotic Personality of Patients with Agitated Depression W B Titley New York—p 333
- Familial Neurosyphilis of Dementia Paralytica Type W C Menninger and M Grotjahn Topeka Kan—p 343
- Studies in Diseases of Muscle III Metabolism of Creatine and Creatinine in Myasthenia Gravis Including a Study of Excretion of Nucleosides and Nucleotides A T Milhorat and H G Wolff New York—p 354

**Protamine Zinc Insulin.**—Reese and Vander Veer treated nine patients with schizophrenia for more than a month Each of them received from thirteen to nineteen intramuscular injections of protamine zinc insulin The insulin dose was begun with 40 units daily in most cases and was raised in steps of 10 units Most of the patients received a maximal dose of 120 units, but this was continued for only two or three days They hoped that the slow action of protamine zinc insulin might enable them to induce and maintain long-continued hypoglycemic states of high therapeutic effect minus some or all of this dramatic symptomatology They abandoned the method after a month and returned to the use of regular insulin The effects of equal doses of protamine zinc insulin are not always the same, the dose must be constantly varied, since no uniform shock dose can be established, closer laboratory cooperation, with frequent determinations of the blood sugar, is required with this compound than with regular insulin, the danger of after-shock is greater, and epileptiform shocks are somewhat more frequent Shock therapy with protamine zinc insulin differs from that with regular insulin, since with large doses the fasting (morning) sugar level declines steadily and it is almost impossible to produce comatose, wet shock The comatose phase of insulin shock depends on the rate of fall of the blood sugar as well as on the level reached

**Cerebral Dysrhythmias of Epilepsy.**—The Gibbss and Lennox have electro encephalograms for more than 400 patients with daily records for some, others were studied at long intervals and others for long periods, the longest thirty-four hours Their conclusions are 1 Epilepsy is the expression of improper functioning of the rhythm-regulating mechanisms of the brain 2 Abnormalities of rhythm are common to all parts of the nervous system 3 In certain portions of the cortex they can be correlated with certain clinical types of epilepsy, a fast rhythm spells grand mal, a slow rhythm psychomotor and an alternating slow and fast rhythm petit mal epilepsy 4 The symptoms which accompany abnormal electrical activity depend on the function of the area or areas of the brain involved, the rapidity of the rhythm (high frequencies producing overactivity and slow frequencies underactivity) and the amplitude of the activity, for on this will depend the intensity of the symptoms 5 The rate of both normal and abnormal rhythms can be altered by the administration of certain drugs and by changes in the physiologic reactions of the body 6 In a case in which the abnormal rhythms were present only in sleep and were confined to the frontal area the anterior portions of both frontal lobes were removed, with subsequent virtual disappearance of abnormal rhythms and great improvement in seizures

**Correlation of Vision and Localization of Cerebral Tumors.**—Believing that functional visual tests might be of value for the localization of tumors of the brain, Elsberg and

Spotnitz carried out such tests in fifty persons suspected of intracranial tumors after a large number of investigations were made on healthy persons. It appears that 1 In cases of supratentorial tumor the duration of the refractory period after stimulation by continuous light is longer in the eye contralateral to the affected hemisphere. 2 When the lesion is in the frontal lobe the duration of the refractory period after stimulation of the homolateral eye with flickering light is longer than that after continuous stimulation of the same eye. 3 When the lesion is in the parietal or the occipital lobe, the duration of the refractory period after stimulation of the homolateral eye with flickering light is shorter than that after continuous stimulation of the same eye.

### Archives of Otolaryngology, Chicago

27 1142 (Jan) 1938

- Otic Sinus Thrombosis J M Sutherland Detroit—p 1  
Osteomyelitis of the Mandible T E Carmody Denver—p 35  
Cartilage Transplanted Beneath Skin of Chest in Man Experimental Studies with Sections of Cartilage Preserved in Alcohol and Buried from Seven Days to Fourteen Months L A Peer Newark N J—p 42  
Effect of Limited Cochlear Lesions on Cochlear Potentials and Middle Ear Muscle Reflexes H G Kobrak J R Lindsay H B Perlman and H Dubner Chicago—p 59  
\*Infection of Blood Stream Medical Treatment with Especial Reference to Transfusions or Immunized Blood Report of Cases E G Gill Roanoke Va—p 67  
Further Studies in Hydrogen Ion Concentrations of Nasal Secretions Catherine C Buhrmester Nashville Ill—p 83  
Gangrenous Otitis of the Paranasal Sinuses Case A Lewis Chicago—p 91  
Functional Examination of Hearing R Sonnenschein and N Leshin Chicago—p 97

**Infection of Blood Stream**—Gill declares that successful therapy depends on early and adequate intravenous administration of immunized blood polyvalent antistreptococcus serum solutions of dextrose and sodium chloride and sulfanilamide or its derivatives. Transfusions of whole blood from a donor convalescent from surgical streptococcal infection is more desirable than therapy with scarlet fever serum. The duration of immunity in compatible convalescent donors is not known. The surgeons of the hospitals of each city should make a permanent record of patients who have recovered from infection of the blood stream and secure permission for grouping thus making them available as donors for emergency transfusions. Certain general measures such as adequate feeding rest stimulants and proper elimination by the bowels and kidneys must be carefully outlined from day to day.

### Illinois Medical Journal, Chicago

73 188 (Jan) 1938

- Value and Limitations of Encephalography in Children A Levinson Chicago—p 21  
\*Bronchoscopy in Bronchial Asthma A H Andrews Jr Chicago—p 25  
Clinical Problems in Diabetes R W Keeton Chicago—p 31  
Typhoid Carrier Control in Illinois G H Gowen Champaign—p 38  
Surgical Pathology of Tumors of the Breast R B Malcolm Chicago—p 43  
X Ray Therapy in Cancer of the Breast J T Case Chicago—p 46  
Icterus in the New Born C D Butler Oak Park—p 50  
Experience with Periodic Method of Roentgenotherapy in Treatment of Buccopharyngeal Carcinoma A Brunschwig and D Tschetter Chicago—p 54  
\*Mucocoeles of Appendix F J Jirka and C S Scuderi Chicago—p 57  
Improved Postoperative Care W C Bornemeier Chicago—p 58  
Some Physical Aspects of Radiation Therapy R Landauer Highland Park—p 64  
Heterotopic Independent Adenomyomatous Tumors of Female Pelvis J A Graham and E H Bukofzer Chicago—p 69  
Use of Diminutophenol for Obesity Regulating in Absolute Blindness and Deprivation of Both Globes C B Welton Peoria—p 72  
Diarrhea Gastrocolic Fistula Report of Seven Cases Based on 7000 Proctocolic Examinations M H Streicher Chicago—p 77  
Mortality Report of Department of Obstetrics and Gynecology of the University of Chicago Clinics and of the Chicago Lying In Hospital May 25 1931 to June 30 1936 C P Huber and H C Hesseltine Chicago—p 78  
Brain Pathology and Mental Alteration B Terchen Chicago—p 8

**Bronchoscopy in Bronchial Asthma**—Andrews states that the value of bronchoscopy in bronchial asthma is threefold diagnostic aspiration of secretion for vaccines and therapeutic. Bronchoscopy is of diagnostic value in bronchial asthma

because it is a means toward diagnosing the type of tracheo-bronchial changes and in differentiating asthma from other conditions. The value of bronchoscopic aspirated vaccines has been demonstrated repeatedly to be superior to sputum vaccines. The methods by which bronchoscopy relieves bronchial asthma may be listed as follows: removal of secretion, stretching and dilation of the bronchi, breaking into the vagus reflex arc and application of drugs. Aspiration of secretion is probably the most significant mechanism. The secretions which are blocking the airway and are of such a nature that they cannot be removed by cough and ciliary action are aspirated. The removal of these secretions aids the defensive and reparative processes of the mucosa, causing an improvement in the bronchitis with subsequent lessening of the secretions. In cases complicated by pulmonary atelectasis, aspiration of the obstructing secretions causes an improvement in the atelectasis and the asthma. Bronchoscopic therapy is a symptomatic method of treatment and is only an adjunct to the allergic management and treatment. An exception to this might be those cases of intrinsic bacterial allergy of bronchitic origin in which bronchoscopy would have a therapeutic effect on the etiologic bronchitis. Of 235 cases reported in the literature, a favorable result was obtained in 78 per cent, temporary improvement in 3 per cent and no improvement in 17 per cent. The conditions that indicate a more favorable response are an onset associated with an infectious disease and secretion difficult of spontaneous removal. The conditions that indicate a poorer response are a small amount of secretion and a chronic catarrhal tracheobronchitis. The results are also poorer as the age of the patients and duration of the asthma increase.

**Mucocoeles of the Appendix**—Jirka and Scuderi define mucocoele of the appendix as an accumulation of a mucous or mucoid secretion in either the lumen, the wall or the mesenteric attachment of the vermiform appendix. The postmortem records of the Cook County Hospital from January 1929 to January 1937 (9,180 cases) revealed only four instances, or 0.043 per cent. From July 1928 to January 1937, among 9,535 surgically removed appendices there were twenty-two (0.23 per cent) instances of mucocoele. The reports of other investigators give an incidence of from 0.2 to 0.68 per cent. Occlusion of a portion of the appendicular lumen with holding back of the glandular secretion is probably the underlying cause. When malignant changes occur, however, the pathologic appearance changes to one of a diffuse pseudomucinous peritonitis. The prognosis is good, with the exception of rare malignant changes, which as a rule are primarily ovarian tumors with secondary metastasis to the appendix.

### Iowa State Medical Society Journal, Des Moines

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- Polycythemia and Hypertension E V Allen Rochester Minn—p 41  
Impacted Urethral Calculi Complicating Prostatism W A Hicks Sioux City and L F Eaton Schaller—p 45  
Expanding Scope of Transurethral Prostatic Resection by Means of Two Stage Operation P F Olson Dubuque—p 47  
Typhus Fever in the United States J C Barton Independence—p 50  
Later Contributions to Treatment of Fractures J A W Johnson Newton—p 52

### Johns Hopkins Hospital Bulletin, Baltimore

62 190 (Jan) 1938

- Intermittent Blood Flow in Capillaries of Human Skin J Bordley 31  
M H Grow and W B Sherman Baltimore—p 1  
Studies in Hemolytic Anemia I Hemolysis Compensatory Regeneration and Erythroblastosis H W Joseph Baltimore—p 25  
\*Id II Presence of Antihemolytic Factor in Human Plasma H W Joseph Baltimore—p 53  
\*Id III Pig's Plasma as Source of Antihemolytic Factor H W Joseph and Perlina Winocur Baltimore—p 70  
Inhibitory Effect of Sulfanilamide on Development of Experimental Tuberculosis in the Guinea Pig A R Rich and R H Folliott Baltimore—p 77  
Platelet Reducing Substance in Splenic Thrombocytopenic Purpura Preliminary Report C F Troland and F C Lee Baltimore—p 82

**Antihemolytic Factor in Human Plasma**—Joseph studied the equilibrium between blood destruction and formation as measured by urobilin excretion in the stools and the reticulocyte count the part played by erythroblastosis considered as a result of disturbance in erythropoiesis the mechanism of the

crises in terms of an acute disturbance in the equilibrium between blood destruction and formation and the mechanism by which transfusion acts in hemolytic anemia. The most dramatic results of transfusion are seen in the acute cases, in which transfusion not infrequently appears to terminate the process abruptly, but even in the congenital or constitutional cases the total effect of transfusion transcends the immediate result of blood replacement. The principal measurable effect is on total urobilin excretion. The urobilin excretion in congenital hemolytic and sickle cell anemia is a measure of blood destruction, therefore it may be concluded that transfusions and injections of plasma concentrate are factors in the reduction of the amount of blood destruction. In the majority of cases the reduction in blood destruction was accompanied by a rise in red cells, but in some the red cells failed to rise, nor was the extent of the rise in red cells always parallel to the fall in urobilin excretion. This indicates the presence of other factors in these cases besides blood destruction. What these other factors are has not been ascertained, but they appear to be related to erythropoietic activity and especially to the presence of erythroblastosis. The variability in red cell response limits the therapeutic applications of the injections. The results indicate the possibility that in sickle cell and congenital hemolytic anemia something is lacking that is present in normal blood plasma. The effective substance has thus far been found in the ether-insoluble fraction of concentrated protein-free plasma and is effective in minute amounts.

### Journal of Clinical Investigation, New York

17 1118 (Jan) 1938

- Chloride Depletion in Conditions Other Than Addison's Disease. A W Winkler and O F Crankshaw. New Haven Conn.—p 1
- \*Effects on Cardiovascular System of Fluids Administered Intravenously in Man. I. Studies of Amount and Duration of Changes in Blood Volume. D R Gilligan, M D Altschule and Marie C Volk. Boston.—p 7
- Studies of Gonococcal Infection. III. Comparison of Bactericidal Properties of Synovial Fluid and Blood in Gonococcal Arthritis. W W Spink and C S Keefer. Boston.—p 17
- Id. IV. Effect of Mucin on Bacteriolytic Power of Whole Blood and Immune Serum. C S Keefer and W W Spink. Boston.—p 23
- Renal Excretion of Endogenous Creatinine in Man. Comparison with Exogenous Creatinine and Inulin. B F Miller. New York and A W Winkler. New Haven Conn.—p 31
- Effect of Epinephrine in Circulatory Collapse Induced by Sodium Nitrite. R W Wilkins, S Weiss and Florence W Haynes. Boston.—p 41
- Neutralization of Encephalitis Virus (St Louis 1933) by Serum. R S Muckenfuss, J E Smadel and Elizabeth Moore. St Louis.—p 53
- Respiratory Properties of Arterial Blood in Normal Man and in Patients with Disease of Liver. Position of Oxygen Dissociation Curve. A Keys and A M Snell. Rochester Minn.—p 59
- Observations on Renal Threshold for Ascorbic Acid in Man. J M Faulkner and F H L Taylor. Boston.—p 69
- Distribution of Body Water and Electrolytes in Adrenal Insufficiency. H E Harrison and D C Darrow. New Haven Conn.—p 77
- Effect of Hyperthermia on Distribution of Water and Electrolytes in Brain Muscle and Liver. H Lannet and D C Darrow. New Haven Conn.—p 87
- Metabolism of Blood Pigments in Pernicious Anemia. K Dobriner and C P Rhoads. New York.—p 95
- Excretion of Coproporphyrin I Following Hemorrhage in Dogs. K Dobriner and C P Rhoads. New York.—p 105
- Influence of Epinephrine on Digital Arterioles of Man. Study of Vasoconstrictor Effects. T J Gatherree and E V Aller. Rochester Minn.—p 109

**Effects of Intravenous Fluids on Cardiovascular System**—Gilligan and his co-workers studied the changes in the blood volume and the effects on the dynamics of the circulation after the injection of isotonic and hypertonic fluids intravenously in forty-two subjects not suffering from shock, most of whom showed no evidences of dehydration or cardiac or renal insufficiency. Plasma and blood volumes were found increased immediately after the end of injection. In persons receiving a given volume of solution of given composition the greatest increases in blood volume were usually obtained after the faster rates of injection, and the lesser increases at the slower rates of injection. The average increases in plasma and blood volume were somewhat greater when the hypertonic solution of 5 per cent dextrose in physiologic solution of sodium chloride was given than after plain physiologic solution of sodium chloride. The percentage of the injected fluid present in the circulation decreased as the volume of fluid injected increased. After intravenous fluids, the forces which govern the escape of fluid from the circulation normally act to resist

increases in blood volume of approximately more than 20 per cent. The plasma and blood volumes have been found appreciably increased up to approximately two hours after injections of 1,000 cc of 0.85 per cent saline solution or of 5 per cent dextrose in 0.85 per cent saline solution at rates of 30 cc per minute or greater. Uncomplicated operations do not cause an appreciable reduction in the blood volume as evidenced by the absence of change in hematocrit and concentration of serum protein after operation, the increase in blood volume after the intravenous injection of fluids was not influenced by such operations. Pulmonary congestion, which occasionally occurs after intravenous injections of fluid, may result from the rapid increase in blood volume. A subsequent paper will report the effect of these injections on arterial and venous pressures, the work of the heart and related aspects of the circulation.

**Epinephrine in Circulatory Collapse Induced by Sodium Nitrite**—Wilkins and his associates studied the effect of epinephrine in vasomotor collapse induced by sodium nitrite in subjects in the upright position. Both in the horizontal and in the upright position, epinephrine in subcutaneous doses of 1 mg caused arteriolar constriction and decreased blood flow through the hand. The venous tone became increased, as did the arterial pulse pressure and the cardiac rate, the venous pressure was usually slightly elevated. Epinephrine did not prevent the vasomotor collapse and syncope produced by sodium nitrite, mainly because the arteriolar constriction and the tissue anoxia were enhanced and because the decreased venous tone produced by nitrite was not adequately compensated for. The experiments indicate that the level of the arterial pressure is not a reliable index of the clinical manifestations of vasomotor collapse or of the degree of tissue anoxia. The fact that epinephrine is ineffective in nitrite collapse does not rule out its efficacy in other types of collapse.

### Journal of Urology, Baltimore

39 180 (Jan) 1938

- Clinical Data Concerning Chronic Pyelonephritis. W F Briasch, Rochester Minn.—p 1
- Squamous Cell Carcinoma of Renal Pelvis. Case with Invasion of Duodenum. J A Lazarus. New York.—p 34
- Gas Cysts of Urinary Bladder. H A Levin. New Haven Conn.—p 45
- \*Peritoneal Lavage in Treatment of Uremia. Experimental and Clinical Study. J B Wear, I R Sisk and A J Trinkle. Madison Wis.—p 53
- Primary Retroperitoneal Leiomyosarcoma. E K Morgan and C M Stone. Brooklyn.—p 63
- Extrarenal Extravasation Observed in Course of Intravenous Urography. P A Narath. New York.—p 65
- \*New Substitute for Ketogenic Diet. J K Narat. Chicago.—p 75
- Local Use of Arsphenamines in Acute Gonorrheal Urethritis. J E Heslin and W A Milner. Albany N Y.—p 77

**Peritoneal Lavage in Treatment of Uremia**—Wear and his colleagues made experimental studies on dogs in uremia to try to discover an efficient perfusing fluid that could be used in the human patient. They chose Hartmann's solution for the perfusion fluid. The procedure was carried out under morphine and pentobarbital sodium anesthesia. For continuous perfusion two trocars were used. The fluid was kept at a temperature of 40 C in a water bath. Specimens of blood were taken before and after the lavage and specimens were taken from the recovered lavage fluid. A normal dog was lavaged on five different occasions at intervals of from two to seven days. Each time the animal recovered and showed no ill effects. The greatest loss occurred in the blood sugar but was not sufficient to cause concern. However, the decrease in the alkali reserve was more significant in that this factor is rather markedly depressed in severe uremia. A second dog was lavaged on three different occasions and the changes in the blood calcium, magnesium, phosphorus, sodium and potassium were studied. There was no appreciable loss in the charted blood constituents, and the dog recovered without incident. The loss in the alkali reserve was not marked. Five uremic dogs were then studied by the same technique. The decrease in the nonprotein nitrogen of the blood ranged from 10 to 59 mg per hundred cubic centimeters. The greatest reduction occurred in cases in which the nitrogen retention was highest. The lack of clinical improvement in these dogs and their early death may be partly explained by the fact that the solution was not buffered properly and had a  $pH$  of 4.2.



and that all dogs showed a marked acidosis at time of death. It was also noted that normal dogs anesthetized with morphine and pentobarbital sodium showed a rapid recovery after lavage. The inability of uremic dogs to rid themselves of these anesthetic agents may have been a factor in their death. That nonprotein nitrogen could be eliminated in fairly large amounts through the peritoneum was demonstrated sufficiently to justify trying the method on three patients. The authors do not offer peritoneal lavage as a treatment in hopelessly damaged kidneys, but it is a method worthy of trial in cases in which there is some hope of return of renal function. The treatment of uremia by this method is the treatment of a secondary damaging factor. Every effort should be made to combat the marked fall in the carbon dioxide combining power of the blood, which is a rather constant and dangerous result of uremia.

**Possible Substitute for Ketogenic Diet**—Narat's observations on dogs showed that fat emulsion introduced intravenously is well tolerated and apparently utilized for metabolic purposes. The harmlessness of such injections has been proved by clinical observations of experimental animals and also by microscopic examinations of sections of brains, lungs and other organs in which fat embolism is likely to occur. These studies were supplemented by ultramicroscopic observations of the size of fat particles and determination of the rate of their disappearance from the blood stream. The emulsion contains 7 per cent of total lipids composed of 35 per cent lecithin and 35 per cent pure olive oil. The product is stable and the fat particles do not coalesce. It is suggested that the product could be used as a substitute for a ketogenic diet or a supplement to it. Surprisingly good results were obtained in three cases of pyelitis. Further studies are necessary to establish the value and limitations of the method.

### Michigan State Medical Society Journal, Lansing

37 1 104 (Jan.) 1938

- Maternal Care in Michigan Progress Note A M Campbell Grand Rapids—p 17  
Obstetric Forceps and Their Use N F Miller Ann Arbor—p 22  
Modern Surgery of Biliary Tract C D Brooks Detroit—p 25  
Acute Hematogenous Metaphysitis C H Snyder Grand Rapids—p 30  
Tuberculosis and Pregnancy R S Siddall Detroit—p 34  
Luteal Cysts Associated with Chorioma Case Reports H M Nelson and C F Shelton Detroit—p 39  
Cancer In and About the Mouth H C Saltzstein and M Z Feldstein, Detroit—p 43  
Occupational Skin Disease A E Schiller Detroit—p 50  
Neurofibromatosis Von Recklinghausen's Disease N E Aronstam, Detroit—p 55  
Animal Experimentation W T Dempster Ann Arbor—p 57

### New England Journal of Medicine, Boston

218 53 96 (Jan 13) 1938

- Physical Modalities in Treatment of Discrete Superficial Skin Lesions F P McCarthy Boston—p 53  
Treatment of Gonorrhea in Women by Means of Systemic and Additional Pelvic Heating W Bierman and E A Horowitz New York—p 60  
Traumatic Injury of Condylar Process of Mandible K H Thoma Boston—p 65  
Immediate Surgery in Acute Cholecystitis H M Clute and J F Lembright Boston—p 72  
\*Presence of Hemolysins in Acute Hemolytic Anemia Preliminary Note W Dameshek and S O Schwartz Boston—p 75

**Presence of Hemolysins in Acute Hemolytic Anemia**—Dameshek and Schwartz have observed three cases of severe hemolytic anemia characterized by acute onset, rapid development of profound anemia, fever, slight to moderate icterus and slight to moderate splenomegaly. In the first two cases the blood picture showed high color index, increased mean corpuscular volume, macrocytosis and nucleated red blood cells. The resistance of the red cells to hypotonic saline solution was normal. In the third case the blood picture corresponded to that commonly seen in congenital hemolytic icterus. Neither large daily doses of concentrated liver extract given parenterally in the first case nor repeated transfusions of blood in all the cases were of any therapeutic value. Splenectomy was, however, followed by prompt and dramatic response, and complete recovery occurred in the three cases. The hemolytic character of the anemia in these cases is demonstrated by the following laboratory criteria: bilirubinemia, absence of bile in the urine and increased urinary urobilinogen, together with the sign of

greatly increased regenerative activity on the part of the bone marrow as evidenced by polychromatophilia, reticulocytosis, nucleated red blood cells, the presence of immature polymorphonuclear cells and hyperplasia of the bone marrow on direct examination at biopsy. In performing compatibility tests with the serum of the second patient it was noted that hemolysis of the red cells of prospective donors occurred frequently. Numerous experiments were then performed which demonstrated the presence in the patient's blood serum of a hemolytic factor which was active against cells of all four blood groups, normal control experiments being negative. On the appearance of the third case, tests for hemolysin again demonstrated the presence of a hemolytic factor active against the cells of all blood groups. The serum of the first patient was then investigated and showed a similar, but weak, hemolytic activity.

### New Orleans Medical and Surgical Journal

90 387 444 (Jan.) 1938

- Present Status of the Health Examination W H Perkins, New Orleans—p 387  
Relation of the Specialist to the General Practitioner J B Gooch New Orleans—p 392  
Epidural Anesthesia in Gynecology and Obstetrics P Graffagnino New Orleans—p 396  
\*Pellagra Secondary to Lesions of Gastro-Intestinal Tract W M Scott Shreveport La—p 403  
Nontuberculous Lung Abscess J D Rives R C Major and S A Romano New Orleans—p 410  
Plastic Surgery as Allied with Treatment of Cancer N Owens New Orleans—p 417

**Pellagra Secondary to Lesions of Gastro-Intestinal Tract**—Scott points out that pellagra secondary to lesions of the gastro-intestinal tract occurs more frequently than is suspected and that the patients who do not respond to a proper diet in a short time, or those who give a history of having been on a normal diet and develop signs and symptoms of pellagra, should be examined for some lesion of the gastro-intestinal tract as a causative factor. Fourteen such cases are reported seven with typical rectal lesions of venereal lympho granuloma, two with carcinoma of the stomach, two with definite evidence of malignant manifestations with metastasis and one each of stricture of the esophagus, rectal polyp, recto vaginal fistula and amebiasis. Any gastro-intestinal lesion that will not allow the proper absorption of the necessary elements and vitamins will eventually cause a deficiency and pellagra.

### New York State Journal of Medicine, New York

38 83 160 (Jan 15) 1938

- Pelviroadiography Clinical Evaluation C E Henton, New York—p 83  
Supervision in Compensation Cases J J Moorhead, New York—p 88  
Benign and Malignant Lesions of the Breast Diagnosis and Treatment L C Kress Buffalo—p 92  
Polycythemia Vera Report of Fourteen Cases Treated with Acetyl phenylhydrazine K R McAlpin and Katherine Edsall Smith New York—p 101  
Persistent Vomiting in Early Life with Special Reference to Obstructions of Gastro-Intestinal Tract S W Clausen Rochester—p 110  
Traumatic Subdural Hematoma S W Gross and T J O'Hane, New York—p 117  
Bacillus Alcaligenes Infections L H Goldberg Nyack—p 127

### Psychiatric Quarterly, Utica, N Y

12 1 212 (Jan) 1938

- Some Observations in Treatment of Dementia Praecox with Hypodermic M Schatner and F J O'Neill Central Islip N Y—p 5  
Study of Impairment of Abstract Behavior in Schizophrenic Patients Marjorie Bolles and K Goldstein New York—p 42  
\*Clinical Effects of Benzadrine Sulfate in Mental Patients with Retarded Activity L F Woolley Torson Md—p 66  
Serology in General Paresis J R Blalock and L E Hinkle New York—p 84  
Intracerebral Meningiomas (Choroidal Fibroblastomas) A Ferraro and J Siris New York—p 117  
Role of Physical Therapy in Treatment of Nervous and Mental Diseases R Kovacs New York—p 123  
Psychiatric Aspect of Head Injuries I N Wolfson Poughkeepsie N Y—p 137  
Technical Approaches Used in Study and Treatment of Emotional Problems in Children J Louise De Pert New York—p 176

**Effects of Benzadrine Sulfate on Mental Patients**—Woolley used benzadrine sulfate in the treatment of forty-four cases diagnosed as schizophrenic, twenty-one as manic depressive and five as psychoneurotic. The patients were observed



for from six to nineteen months. About 25 per cent of the retarded patients in all diagnostic groups may be improved by the administration of the drug, about 25 per cent of the retarded patients in all diagnostic groups are made much worse by its exhibition and approximately 50 per cent do not appear to be affected. In general those patients who showed evidences of agitation or fear and anxiety were either not materially affected or were made worse. Altogether similar patients, however, were in several instances improved by proper benzedrine dosage. Since patients who reacted favorably to the medication showed practically immediate improvement on the administration of doses of 10 mg over a period of from one to three days, lack of response to small doses or unfavorable response to small doses should be taken as an indication for discontinuing the medication. Benzedrine sulfate properly administered in states of extreme depression and retardation may on occasion determine the difference between prolonged serious illness and fairly prompt recovery. A number of retarded patients, regardless of diagnostic grouping, can be materially benefited in their feelings of well being and in their initiative. On the other hand, the drug is not without its attendant dangers, and promiscuous and uncontrolled use is to be seriously condemned even with small doses.

### Public Health Reports, Washington, D C

53 37 68 (Jan 14) 1938

Studies in Chemotherapy VII Some New Sulfur Compounds Active Against Bacterial Infections H Bauer and S M Rosenthal—p 40  
Recent Developments in Our Knowledge of Plague Transmission C R Eskey—p 49

53 69 112 (Jan 21) 1938

Blacktongue Preventive Value of Whole Whey Delactosed Whey and American Cheese W H Sebrell R H Onstott and D J Hunt—p 72  
Riboflavin Deficiency in Dogs W H Sebrell and R H Onstott—p 83  
Toxicology of Selenium V Toxic and Vesicant Properties of Selenium Oxichloride H C Dudley—p 94

### South Carolina Medical Assn Journal, Greenville

34 1 24 (Jan) 1938

Skin Problems Encountered in General Practice A B Cannon New York—p 1

### Southern Surgeon, Atlanta, Ga

7 1 96 (Feb) 1938

Surgical Treatment of Diverticulitis F W Rankin and A E Grimes Lexington Ky—p 1  
New Skull Traction Appliance J D Blackburn Thomaston Ga—p 16  
Central Fractures of Neck of Femur J S Speed Memphis Tenn—p 19  
Congenital Abnormalities of the Female Genitalia O Moore Charlotte N C—p 40  
Clinical Application of Aschheim Zondek and Friedman Test M L Stadium New Orleans—p 44  
Injuries to Bones of the Elbow A H Weiland Coral Gables, Fla—p 54  
Electrosurgery F H Krusen and E C Elkins Rochester Minn—p 61  
Use of Prepuce to Epithelize Tract in Treatment of Imperforate Anus T C Davison Atlanta Ga—p 68

### Tennessee State Medical Assn Journal, Nashville

31 1 40 (Jan) 1938

Some Medical References in Shakespeare W H Witt Nashville—p 1  
\*Chronic Middle Ear and Mastoid Infection M M Cullom Nashville—p 11  
Increasing Responsibility of the Physician to the Infant and Small Child F T Mitchell Memphis—p 18

**Chronic Middle Ear and Mastoid Infection**—Cullom arrives at the following conclusions on the problem of chronic suppuration of the middle ear and mastoid after sixteen years of investigation. 1 At least 85 per cent of purulent infection of the middle ear and mastoid are the result of a purulent sinusitis, nearly always on the same side as the infected ear and mastoid. 2 Of those having scarlet fever, 91 per cent have a coincident infection in the sinuses. It is presumed from clinical symptoms that about the same percentage have a coincident sinusitis in epidemic influenza. 3 If 91 per cent of patients ill with scarlet fever and influenza, together with those having sinusitis in the other exanthematous diseases, have infection in the sinuses, at one time or another practically the entire population suffers from sinus disease. 4 A large proportion of those so infected are left with a chronic sinus

infection that tends to last throughout life unless diagnosed and treated. 5 These chronic residual infections constitute a menace to the life, health and hearing of those so infected and make the victim a carrier infecting others by contact and starting epidemics. 6 What is diagnosed as an acute sinus infection is often an acute exacerbation of a chronic sinus infection. 7 When the relationship is established between a chronic middle ear suppuration and a purulent sinusitis, the first step in the treatment of the ear is the elimination of the sinus infection.

### Texas State Journal of Medicine, Fort Worth

33 605 670 (Jan) 1938

Surgical Treatment of Head Injuries with Especial Reference to Remote Sequels W L Crosthwait Waco—p 610  
Present Status of Surgery of Thyroid Gland G A Stevens Hollywood Calif—p 613  
Hysterectomy Report of End Results C H Harris Fort Worth—p 618  
Cesarean Section Analysis of 113 Cases T F Bunkley Temple—p 623  
Extraperitoneal Cesarean Section Report of Cases C Hiatt, Fort Worth—p 626  
Ovarian Cystadenoma Masked by Abdominal Trauma in Eight Year Old Child H W Newman Austin—p 631  
Fractures of Lower Extremity J Becton Greenville—p 633  
The Management of Psychiatric Patients in a General Hospital T H Harris and H Ford Galveston—p 636  
Roentgen Therapy of Breast Cancer W G McDeed C P Harris and E M Parker Houston—p 641  
Chronic Actinic Dermatitis Occupational Hazard of the Southwest L M Smith El Paso—p 644

### Western J Surg, Obst & Gynecology, Portland, Ore

46 1 60 (Jan) 1938

Cesarean Section Material of R K Smith T H Kelly, San Francisco—p 1  
Analysis of 507 Consecutive Cases of Cesarean Section E M Lazard Los Angeles—p 6  
Discussion of Indications for Cesarean Section P H Arnot, San Francisco—p 21  
Death After Cesarean W B Thompson and E J Krahulik Los Angeles—p 31

### Yale Journal of Biology and Medicine, New Haven

10 209 308 (Jan) 1938

The History of Modern Physics in Its Bearing on Biology and Medicine F S C Northrop New Haven Conn—p 209  
Whooping Cough Observations on Experimental Infection in Mice and in Ferrets C S Culotta New Haven Conn F L Marting Boston, and A A Liebow New Haven Conn—p 233  
Glass Electrodes and Apparatus for Direct Recording of Hydrogen Ion Concentration in Vivo L F Nims New Haven Conn—p 241  
Bacterial Flora of the Human Vagina L Weinstein New Haven Conn—p 247  
Importance of Correlating Specific Gravity of Urine with Intensity of Color Change in Histidine Pregnancy Test C W Neuhardt Valhalla, N Y—p 261  
Steady State Electrical Properties of Human Organism During Sleep H S Burr and Dorothy S Barton New Haven Conn—p 271  
\*Sulfanilamide in Ophthalmia Neonatorum T Willis, New Haven Conn.—p 275  
Effect of Replantation Lens Removal and Optic Nerve Section of Eye of Salamander (*Triturus Viridescens*) R R Chace Providence R I—p 281  
Relation of Psychiatry to Public Health I V Hiscock New Haven Conn—p 289

**Sulfanilamide in Ophthalmia Neonatorum**—Willis cites four cases of gonococcal ophthalmia neonatorum treated with sulfanilamide, in addition to the details of the case referred to by Hageman. Besides the drug, these infants have received auxiliary treatment locally of saline or boric acid irrigations as often as needed to keep the eye free from pus, and cold compresses for any local swelling. The use of sulfanilamide gave a more rapid improvement and cure in these cases of gonorrheal ophthalmia neonatorum than has ever been seen in the clinic with other treatment. A definite routine of treatment has not been evolved. However, it is felt that a large initial dose should be given to attain an immediate high concentration of the drug. It seems necessary to reach a level of around 7 mg per hundred cubic centimeters (free) for active results. Between 0.2 and 0.25 Gm of sulfanilamide per kilo gram of body weight daily in regularly spaced doses usually produces the requisite concentrations. The hemoglobin should be followed closely and transfusion given as indicated. Other complications also should be watched for.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Radiology, London

11 164 (Jan.) 1938

- X Rays in 1896 C. T. Holland—p. 1  
 \*Osteitis Tuberculosa Multiplex Cystoides and Sarcoid Lesions A. E. Connolly—p. 25  
 Our Heritage R. E. Roberts—p. 38  
 Relative Biologic Effects Produced by Equal Radiation Doses from Radium and from Radon W. H. Love—p. 46

**Multiple Cystic Tuberculous Osteitis and Sarcoid Lesions**—Tuberculous osteitis, in which the predominant feature is marked cystic degeneration of the bone, is of slow evolution and shows a marked tendency to recovery. Connolly presents two cases. One was in an infant with widespread bony involvement and collateral intrathoracic tuberculous disease. Biopsy confirmed the clinical diagnosis. In the other case the cystlike changes were located in five dorsal vertebral bodies, which were in contact with a fusiform perivertebral abscess arising from the primary disease in the sixth and seventh thoracic vertebrae. Owing to the probable tuberculous causation of sarcoid disease, also a case of benign lymphogranulomatosis is cited.

## British Medical Journal, London

1 154 (Jan. 1) 1938

- History of Prevention of Puerperal Fever M. H. Phillips—p. 1  
 \*Lymphoid Tissue of Alimentary Canal H. G. Thompson—p. 7  
 Modern Treatment of Diabetes Mellitus and Use of Zinc Protamine Insulin F. G. Lescher—p. 11  
 Persistent Overmolding of Skull Bones Causing Fits in an Infant G. C. Gordon—p. 14  
 Chronic Disseminated Tuberculosis Illustrated by Case of Corticopleural Disease F. A. H. Simmonds and W. Pagel—p. 15  
 Fracture of Neck of Femur Another Method of Inserting the Smith Petersen Pin H. B. Roderick—p. 16

1 55 104 (Jan. 8) 1938

- Angina of Effort Clinical Study G. Bourne and R. B. Scott—p. 55  
 Shortage of Calcium in the Poorer Class Diet Katharine H. Coward, Elsie W. Kassner and Letitia W. Waller—p. 59  
 Sonne Dysentery R. Miller—p. 64  
 Absence of Antigonadotropic Substances in Blood Serum of Man Injected with Gonadotropic Extracts A. W. Spence, E. F. Scowen and I. W. Rowlands—p. 66  
 Water Requirements of Surgical Patients D. L. C. Bingham—p. 67

**Lymphoid Tissue of Alimentary Canal**—Thompson directs attention to the follicular collections of lymphoid tissue to be found along the alimentary tract (1) at the back of the mouth and nose where there is a ring of lymphoid tissue consisting of the lingual, palatine and pharyngeal tonsils, (2) in the lower part of the small intestine, as Peyer's patches, (3) in the cecum, as the vermiform appendix, and (4) in the large intestine, as solitary follicles. There is a constant and steady discharge of lymphocytes into the alimentary canal and into the subserous lymphatics and so to the thoracic duct. To determine whether a definite migration of lymphocytes into the lumen of the alimentary canal could be confirmed rabbits were operated on, the vermiform appendix was separated from the apex of the cecum, which was closed with a purse-string suture and the open base of the appendix was brought to the surface so that its secretion, if any, might be examined. The ferment amylase present in the secretion of the appendix contained great numbers of lymphocytes, a few large macrophages and some eosinophils. Thus there appears to be a regular flow of cells from the lymphoid tissue into the lumen of the alimentary canal. There was no evidence that the lymphocytes were acting as phagocytes, although numerous bacteria were present. To discover what the reaction of the lymphoid tissue (rabbit) was to pathogenic bacteria the results are suggestive that bacteriolysis takes place either in the lumen of the intestine or in the lymphoid tissue and that bacteria may pass rapidly through the lymph follicles; they may be phagocytosed by the macrophages or, if the infection is a heavy one may pass on into the subserous lymphatics and thus into the general circulation giving rise to a generalized infection. In the rabbit the lymphoid tissue

of the alimentary canal is normally associated with the presence of gram-positive bacteria, and the author's next effort was to try to find where these bacteria came from and whether there were any conditions which affected the amount of lymphoid tissue or the number of organisms present. Accordingly rabbits were put on a diet deficient in vitamin A. It was obvious that the numbers of organisms in the lymphoid tissue were markedly increased. They appeared to be massed in colonies as if they were multiplying locally. Especially was this the case in the lymphoid tissue of the vermiform appendix. When the animals had been deprived of vitamin A their lymphoid follicles showed signs of atrophy, and in the later stages, when signs of xerophthalmia began to develop, the lymphoid follicles were represented by only a thin layer of leukocytes. This was so marked that it was decided to see whether the readministration of vitamin A would cause a regeneration of the lymphoid follicles. After the addition of carotene in oil for one week the lymphoid tissue was examined and it was found that the deeper follicles showed the characteristics of active regeneration, with both superficial and deep follicles present. This work requires confirmation, but it is suggestive as a reason for the decline in the protective mechanism of the organism against infection and also for the loss of immunity against bacterial infection in vitamin A deficiency.

## Irish Journal of Medical Science, Dublin

No. 144 703 758 (Dec.) 1937

- Physiology in Medical Education and Practice W. J. E. Jessop—p. 701  
 Treatment of Peripheral Arterial Occlusion P. T. O'Farrell—p. 719  
 Evolution of Tuberculosis in Man W. Pagel—p. 735  
 Treatment of Mental After Effects of Head Injury F. Pilkington—p. 742

## Journal of Laryngology and Otology, London

53 196 (Jan.) 1938

- \*Surgical Treatment of Chronic Cicatricial Stenosis of Larynx (Simon Lecture 1937) E. Schmiegelow—p. 1  
 Origin of Weber-Bray Response and Electrotherapy of Ear E. Kupfer—p. 16

**Treatment of Cicatricial Stenosis of Larynx**—Schmiegelow believes that every patient with chronic stenosis due to cicatrization of the soft parts, syphilitic perichondritis, ulceration, postoperative lesions, diaphragmatic formation, synechiae and similar pathologic processes can be cured by external surgical intervention, that is, by correct treatment one will be able to obtain so large a passage through the larynx and the trachea that the patient can do without a tracheal cannula and breathe naturally through the mouth. The operative treatment of chronic laryngeal stenosis is to be compared with a cosmetic operation. The chief advantage of the method is that an india rubber drain is firmly fixed in the stenosis in such a way that the dilation can continue uninterrupted for weeks and months without being changed and without any inconvenience to the patient. Before attacking the stenosis itself, the tracheal cannula has to be removed as far away from the larynx as possible by means of an inferior tracheotomy. A week later the stenosis itself is exposed freely by splitting it from the outside by means of a laryngotracheal fissure. If diaphragmatic strictures are present they are removed by means of scissors, knives and punch forceps so that the lumen of the stenosed part of the larynx is made as nearly normal as possible. Then an india rubber drain about 5 cm. long is introduced. It is best to use a drain which is slightly wider than the lumen so that it causes a certain pressure against the walls of the larynx. The india rubber tube is introduced between the lips of the external wound which are kept apart by means of retractors and the drain must be laid so that its ends extend outside the narrowed part of the windpipe. The upper end of the drain lies in the larynx but is not allowed to protrude into the pharynx; it has to be at the level of the upper aditus of the larynx. Fixation of the drain is performed transalaryngeally by means of a long curved slender pericardial needle, which is passed from side to side through the soft parts of the neck, the thyroid cartilage and the drain, then a thin silver wire is drawn back through the throat by means of the needle. The position of the upper end of the drain is controlled either by introducing the exploring finger through the mouth by indirect laryngoscopy, or by direct

(suspension) laryngoscopy in children The upper end of the drain must be above the vocal cords The silver wire is cut as closely as possible to the skin while the skin is pressed down with the scissors, so that the skin slips back into its old position and covers the ends of the wire In children the tracheal cannula has to be left in position during the treatment In adults it is possible in many cases to remove the tracheal cannula directly after having fixed the drain in its proper place, as the large lumen of the drain will permit of perfectly easy respiration through the mouth The drain, having been allowed to remain in position for a sufficient time can, together with the wire, after weeks or months be removed from above through the mouth by a laryngeal forceps, introduced by direct or indirect laryngoscopy This is done in children under general anesthesia, in adults under local anesthesia of the pharynx Even when a drain has been in position for three months it has always been entirely free from incrustations The external wound can either be closed with a few stitches or left to itself, it heals in the course of a few days The author has treated eighteen cases of stenosis of the larynx in this manner and all with good results The ages of the patients varied from 1 to 56 years The nature of the stenosis was different in every case

### Journal of Tropical Medicine and Hygiene, London

41 120 (Jan 1) 1938

- Further Report on Pseudomycosis Indolent Leg Ulcer Based on Study of Fifty Four Patients J F Hamilton—p 1  
Possibility of Treating Schistosomiasis with Unguenta F G Cawston—p 8  
Blood Grouping of Aborigines in the Northwest Portion of Central Australia 1936 Series J B Cleland and T H Johnston—p 10

### Lancet, London

1 65 122 (Jan 8) 1938

- Nutrition and Nutritional Diseases L G Parsons—p 65  
Sympathetic Denervation of Upper Extremity E D Telford—p 70  
\*Prevention of Spontaneous Mammary Cancer in Mice by Thyrotropic Hormone of Pituitary Gland W Cramer and L S Horning—p 72  
\*Surgical Treatment of Angina Pectoris and Allied Conditions D T Davies H E Mansell and L O Shaughnessy with the cooperation of Dawson—p 76  
Transfusion of Blood and Other Fluids in Infancy G Ormiston—p 82

#### Prevention of Spontaneous Mammary Cancer in Mice

—Cramer and Horning state that the spontaneous development of cancer of the breast in female mice of a special strain having a high incidence of mammary cancer can be prevented by the thyrotropic hormone of the anterior pituitary gland The changes in the anterior lobe of the pituitary gland, as well as the development of the mammary gland in males, produced by prolonged administration of estrogen can be kept in check by the simultaneous administration of the thyrotropic hormone The thyrotropic hormone is therefore in some respects a physiologic antagonist to the estrogenic hormone The physiologic antagonism between the estrogenic and the thyrotropic hormone has a bearing on therapeutic applications Thus, the thyrotropic hormone may be useful in the treatment of conditions supposed to be due to an unbalanced action of the estrogenic hormones, such as the precancerous condition of the breast known as cystic disease of the breast (maladie de Reclus Schimmelbusch's disease) and benign enlargements of the prostate

#### Surgical Treatment of Angina Pectoris—Davies and his

associates report initial experiences with the treatment of coronary disease by cardio omentopexy The twenty cases are considered in two groups fifteen cases of angina pectoris and five of other symptoms of cardiac ischemia There were five deaths in the first group, while there is freedom from angina in eight of the remaining ten In the second group there was one death and freedom from symptoms in one case The experimental pathologic and clinical evidence justifies the application of cardio omentopexy to a proportion of patients suffering from defective coronary circulation From consideration of the fourteen surviving patients it is seen that all those who have survived the operation for six months or longer are better, and most of them are free from symptoms Improvement increases with time The authors do not claim to prove that surgical operation offers an unailing cure for angina

but only to support the original contention (O'Shaughnessy 1937) that operation is feasible and attended with a low immediate mortality Now that there is indisputable experimental and pathologic evidence that revascularization of the heart can be induced in man, they feel that its application to a proportion of that enormous group of patients who are suffering from a deficient blood supply to the heart is justified

### Medical Journal of Australia, Sydney

2 1107 1138 (Dec 25) 1937

- Some Danger Signs in Childhood S F McDonald—p 1107  
Dosage System of Cervical Cancer W G Cuscaden and T H Oddie—p 1112  
Choline Esterase in Myasthenia Gravis A B Corhill and A H Ennor—p 1121  
Treatment of Respiratory Failure of Poliomyelitis H McLorman and J Watson—p 1123

### Medical Press and Circular, London

196 122 (Jan 5) 1938

- Hints on Certifying Mental Defectives N H M Burke—p 13  
\*Sciatica and Its Treatment with Especial Reference to Epidural Injection G Slot—p 15

#### Treatment of Sciatica by Epidural Injection—The

method used by Slot in the treatment of sciatica has been a combination of epidural injection and manipulation under *n*-methyl-cyclohexenylmethyl malonylurea anesthesia The advantages claimed by this method are the rapidity of treatment, the simplicity of the technic and the high percentage of cures obtained in comparison to other methods The two principles of the treatment are the stretching of the nerve roots by the harmless fluid and manipulation The needle has first to be introduced in the sacrococcygeal foramen at an angle of about 70 degrees to the skin, to enter the canal, the direction has to be changed to an angle of about 20 degrees to the sagittal plane One can feel when the needle is in the right place, from 50 to 100 cc of warm 1 per cent procaine hydrochloride in sterile physiologic solution of sodium chloride is injected slowly, the dose varying with the size of the patient As the fluid goes in, the resistance is found to increase, the needle is then withdrawn and the puncture is sealed with adhesive plaster Manipulation is now performed This consists first in the hyperextension of the lumbar spine, the knee is placed in the hollow of the back and both legs are firmly and gently pulled against it The patient is then turned round and the knees are straightened, and both legs, one after the other, are forced on the pelvis (the pelvis being fixed by an assistant) so as to stretch the sciatic nerve On recovery, some analgesic is prescribed for pain and massage is given the next day In the majority of the author's cases this has been all that has been necessary, but in 20 per cent of them one treatment has not been sufficient and a second injection has been required In the majority of the series of more than 200 cases the condition has been intractable and has resisted the usual methods of treatment In cases of osteo arthritis of the hip the manipulation is reduced to a minimum, although slight manipulation acting with the epidural injection has been most helpful to the patient This does not apply to the cases in which there has been bony ankylosis While no cure can be promised, patients have been pleased with the great alleviation of pain that has resulted, and the treatment can, if necessary, be repeated in six months

### South African Medical Journal, Cape Town

11 859 902 (Dec 25) 1937

- The Workmen's Compensation Act and Its Problems M Shapiro—p 864  
The Insurers Point of View H Quinton—p 866  
The Medical Association's View J J Levin—p 868  
The Worker's Point of View M Joffe—p 870  
Some Social Aspects of the Workmen's Claims J Cullen—p 872  
Medical Education in Principles of General Practice K Bremer—p 875  
Some Practical Aspects of Diagnosis and Treatment of Rheumatism V Finn—p 878  
Urology in General Practice Points in Technic of Urethral Instrumentation R C Begg—p 883  
Reminiscences and Experiences of an Old Physician V W T Werd muller—p 886

**Annales de Dermatologie et de Syphiligraphie, Paris**

B 921 1055 (Dec.) 1937

Benign Extensive Sclerodermiform Cellulitis Touraine Gole and Souhgnac—p 921

\*Clavicular Sign and Its Diagnostic Value in Hereditary Syphilis G C Higooumenakis—p 939

**Clavicular Sign in Hereditary Syphilis**—Higooumenakis points out that in June 1927 he demonstrated before the medical society of Athens a patient with hereditary syphilis, who had a tumefaction of the internal third of the right clavicle. Subsequently he observed this enlargement of the sternal extremity of the right clavicle in a number of patients in whom hereditary syphilis could be assumed. He gained the impression that this clavicular sign has diagnostic value in hereditary syphilis. Its frequency in persons with hereditary syphilis is much greater than that of the other stigmas. It is never observed in patients with acquired syphilis or in entirely healthy persons. He mentions other investigators who observed this clavicular sign in patients with hereditary syphilis. It is suggested that the enlargement of the clavicle is a hyperostosis, which results from an osteitis that in turn is produced by the spirochetes in the sternal extremity of the clavicle. The author reports the clinical histories of twenty patients with hereditary syphilis in whom the clavicular sign could be observed. He stresses the great value of the sign, which is superior to that of the other stigmas of hereditary syphilis because of its frequency and the ease with which it can be detected.

**Gynecologie et Obstétrique, Paris**

36 481 560 (Dec.) 1937

Atypical Growth of Glands of Body of Uterus Epidermization of Cervical Mucosa Disturbances in Equilibrium Between Ovary and Anterior Hypophysis After Ovarian Interventions A Lipschutz—p 481

\*Surgical Treatment of Suppurated Puerperal Mastitis J Kreis—p 499

\*Value of Radium Therapy in Treatment of Cancer of Vulva J Nuytten and R Garraud—p 508

Unilateral Absence of Adnexa and Amputations by Torsion J G Regad—p 522

Functional Interrelations of Endocrine Glands Between Themselves and with Ovary in Genesis of Ovarian Menstrual Process R Araya—p 534

**Surgical Treatment of Mastitis**—Kreis has treated suppurating puerperal mastitis by means of radiating and large incisions in more than 100 cases, but often without satisfaction. Recovery was slow and the cicatrization, which is accomplished by granulation and retraction, often leaves much to be desired as regards esthetic results. The author developed a modification of the technic. Frequently suppurating mastitis is represented not by a single abscess but by several juxtaposed abscesses, which do not mature at the same time. To avoid repeated incisions and multiple scars, he makes a circular incision at the border of the pigmented zone of the areola. The para-areolar incision is justified because it always provides access to the abscess cavity. Abscesses which are located above the horizontal line that runs through the nipple and divides the breast into two halves can be drained by a para-areolar incision without any other incision. In abscesses of the lower hemisphere of the breast, the author employs a para-areolar incision corresponding to the localization of the abscess and a counter incision in order to have a declivity to facilitate drainage. The counter incision must always be made into the breast itself and not at the base of its insertion. The incision is made circular and parallel to the periphery of the breast. If the breast is voluminous and pendulous and the counter incision has to be made on the internal or external lateral part it is necessary to make an incision parallel to the direction of the slope of the breast in the erect posture. The circular incision involves only the skin, a transverse incision of the galactophorous ducts is not necessary. For drainage, perforated rubber tubes are more effective than gauze drains. The wound should be dressed every day and drainage should be discontinued at the earliest opportunity. In general, drainage of a para-areolar incision does not exceed a week and frequently it can be reduced to three days. The author employed this treatment in forty three cases, not only is the esthetic result better but the cure is more rapid than with the former surgical method.

**Radium Therapy for Cancer of Vulva**—After reviewing the literature on the radium therapy of cancer Nuytten and

Garraud describe their personal experiences in seventeen cases. Radium therapy produced excellent results in cancer of the vulva, in 50 per cent of the cases considerable improvements were obtained, even in cases in which the process was quite advanced, and in half of these cases the cure was complete. The inguinal adenopathies constitute the key to the prognosis. Cases of cancer of the vulva in which there exist no adenopathies have good prospects of cure. If adenopathies exist, recurrences are frequent even after complete bilateral inguinal adenocellulectomy or after irradiation. The authors used the following methods: radium puncture, obturators containing radium, radium moulages and telerradium therapy. Radium puncture was used in twelve cases, in six of which it proved successful, in the other cases, although it counteracted the vulvar ulceration, the patients succumbed to adenopathies. The authors think that radium puncture is the technic of choice for the treatment of localized epitheliomas on the labia, the frenulum and the clitoris. It is necessary to guard against excessive doses, which may provoke necrosis in the sensitive tissues of the vulva. The obturators that contain radium are advisable in cancers of the meatus. The application of radium to the surface by means of moulages or by telerradium therapy is reserved for extensive lesions or for adenopathies.

**Presse Medicale, Paris**

16 169 184 (Feb. 2) 1938

Fractionated Galactosuric Concentration Tests Its Results in Alcoholism Cirrhoses of Liver M Chiray G Albot and J Dierckx—p 169

Applications of Physiopathology of Lung to Collapsotherapy E Morelli—p 171

\*Surgical Treatment of Angina Pectoris by Revascularization of Myocardium M Berard—p 173

**Revascularization of Myocardium in Angina Pectoris**—Berard says that, among the technical advances in surgery, revascularization of the myocardium in angina pectoris is one of the most audacious and brilliant. The results obtained by Beck in the United States and by O'Shaughnessy in England seem sufficiently numerous to justify a discussion of the physiologic bases of this method. Before revascularization was developed by Beck in recent years Klose demonstrated in 1922 the possibility of using free grafts of omentum to replace excised portions of the pericardium, moreover, Leriche and Fontaine in 1932 employed a free graft of the pectoralis muscle and in animal experiments demonstrated that ischemic myocardium gradually regains sufficient if not absolutely normal vascularization by way of an anastomotic circulation. He cites Beck's experiments, which demonstrated the importance of a homogeneous vascular distribution in a given territory of the myocardium. It has been observed that in occlusion of both coronary arteries vascularization of the myocardium is still possible. Theoretically this is possible in two ways, namely, by direct ventricular circulation and by the thebesian circulation. The observation of pericardial adhesion in case of complete obliteration of the coronary arteries suggested the role of these adhesions in reestablishing the myocardial circulation. Realizing the vascular character of these adhesions, Beck conceived the idea of revascularization of the myocardium, that is, the preparation of the so-called vascular bed, which can be done in two ways: by a pediculated graft of the pectoral muscle or by an omental graft. The first of these two methods was used by Beck. In reviewing Beck's work, the author says that of eleven interventions six were successful. O'Shaughnessy, who employed omental grafts, had only one fatality in six cases. That omentectomy is superior to myorrhaphy is shown by O'Shaughnessy's figures.

**Giornale di Clinica Medica, Parma**

19 1 106 (Jan. 20) 1938

Vitamin C and Alkali Reserve A Capuzzi—p 2

Difficulties in Diagnosis of Endocarditis G Donini—p 9

Cholesterol Metabolism in Postencephalitic Parkinsonism G Fattori—p 19

\*Relations Between Circulation and Pressure of Cerebrospinal Fluid and Function of Circulatory and Uroepithelial Organs in Old Age G Zanolto and G Scaramuzza—p 36

**Cerebrospinal Fluid in Old Age**—Zanolto and Scaramuzza made systematic researches on twenty three patients from 68 to 85 years of age, who had arteriosclerosis, arteritis or renal sclerosis. They found the arterial blood pressure

increased in old age. It is not related to the pressure of the venous blood and of the cerebrospinal fluid, which are normal and related to each other. The amount of dextrose in the blood and in the cerebrospinal fluid is increased with a normal ratio. The amount of albumin in the cerebrospinal fluid and the cytology of the fluid are normal. The average figures for chlorides in the cerebrospinal fluid are almost normal. The amount of urea in the blood and the cerebrospinal fluid is increased with a ratio near unity. The elimination of urea through the urine is diminished and Ambard's formula is increased in the majority of cases. It is independent of arterial pressure and of the ratio of urea in the blood and in the cerebrospinal fluid. The increased amount of urea in the blood and in the cerebrospinal fluid depends on the diminished elimination of urea through the urine. Alterations of the pressure of the cerebrospinal fluid or of the chemistry of the fluid are due to pathologic conditions which involve the brain or to disorders of the cerebral circulation. They were observed in six patients in the authors' group who were suffering from cerebral thrombosis, senile dementia and softening of the brain.

### Minerva Medica, Turin

1 113 144 (Feb 3) 1938

- Apogimnic Treatment of Tuberculosis and Cancer E Centanni—p 116  
\*Clinical Researches on Variations of Tuberculin Allergy in Diseases of Lymphatic Glands and Their Clinical Value Especially in Tuberculosis of Lymphatic Glands and Malignant Granuloma C Rotta—p 118  
Phthisis in Adults and Importance of Tuberculosis in Children E Filla—p 127

**Allergy in Diseases of Lymphatic Glands**—Rotta followed the behavior of allergy to tuberculin in a group of 700 patients who were suffering from diseases of the lymphatic glands. He determined the intensity of allergy from the intensity of the tuberculin reaction, which was done by means of an intradermal injection of 0.2 cc of a 1 to 3 per thousand old tuberculin solution. The same dose of a 1 per 500 old tuberculin solution was intradermally injected in anergic patients. The greatest tuberculin reaction consists in the appearance of a necrotic papule at the point of the injection, which shows intense allergy. It appears in almost all cases of tuberculosis of the lymphatic glands, especially if there is caseous degeneration of the glands. It is a reaction proper to tuberculous lymphoma and to tuberculous, tracheobronchial or hilar adenopathies. The reaction is more intense when the lymphatic structures only are involved by tuberculosis than when they, as well as the lung are tuberculous. Patients who are suffering from malignant granuloma are in a condition of anergy or hypo anergy, except when the condition coincides with hyperplasia of the reticulo endothelial tissues especially of the spleen, or with tuberculosis in evolution. Patients who are suffering from tuberculous hyperplasia of Ziegler's type are in a condition of transient anergy, which changes to allergy as the adenopathies and splenomegaly disappear. In myeloid and lymphatic leukemia, lymphosarcoma and reticuloma there is allergy. In tumors of the mediastinum and the liver and tumoral metastases in the lymphatic glands there is anergy. The author concludes that in adults who are suffering from lymphopathies the presence of an intense old tuberculin reaction shows the tuberculous origin of the lymphatic condition. Anergy shows malignant granuloma, tuberculous hyperplasia and tumoral metastases. The negative results of the tuberculin reaction in children who are suffering from adenopathies indicate that the patients do not have tuberculosis.

### Policlinico, Rome

45 152 (Jan 15) 1938 Surgical Section

- Value of Indoxylemia in Diseases of Urinary Tract C Beccari and F Gherardi—p 1  
\*Influence of Zone of Carotid Gland on Calcemia G Gentile—p 22  
\*Variations of Erythrocytosis After Gastric Resection in Duodenal Ulcer Jura—p 31  
Phosphatases of Bones and Plasma in Osteopathies G Montemartini—p 38

**Influence of Zone of Carotid Gland on Calcemia**—Gentile experimented on dogs in which the adventitia of the common, internal and external carotid artery had been removed and the zone of the carotid gland denervated by touching it with 80 per cent alcohol. The calcium in the blood was determined twice before the operation at intervals of two days and

several times afterward at weekly intervals. The author concludes that the denervation of the zone of the carotid artery and of the carotid sinus induces in all cases slight hypocalcemia, which lasts for about one week and is followed by transient slight hypercalcemia. After these changes the amount of calcium in the blood returns to its preoperative value. Hypocalcemia shows the result of the so-called physiologic parathyroidectomy which takes place in men after any simple, surgical intervention on the neck. Hypercalcemia is the result of transient increased function of the parathyroids from vasodilation by the operator and chemical denervation of the carotid zone. Processes of diffused or circumscribed decalcification of the bones did not show on roentgen examination of the skeletons of the animals in the author's experiments. Because of the results of the operation on calcemia, the condition of the parathyroids was not investigated. The results obtained by the author conflict with those reported in the literature by Collazo and his collaborators, who observed in dogs in which the zone of the carotid gland had been removed intense and persistent hypercalcemia associated with loss of muscular activity, emaciation, falling out of the hair and fatal progressive cachexia. However, they confirm those reported by Tabanelli in experiments on the carotid sinus.

**Erythrocytosis After Gastric Resection in Duodenal Ulcer**—Jura discusses the relations between certain segments of the digestive tract and hematopoiesis. He followed the variations of hemoglobin and of erythrocytosis in twenty patients after gastric resection. He found that erythrocytosis and the amount of hemoglobin, which are diminished in patients who are suffering from duodenal ulcers, are still more diminished six months and one year after gastric resection. Erythrocytosis and hemoglobin greatly diminish during the first two weeks following resection, after which they slowly increase to almost normal, the morphology of the erythrocytes and leukocytes is normal and the general condition of the patients improves. The author believes that the diminution of erythrocytosis and hemoglobin that takes place shortly after gastric resection is due to lack of the Castle principle in the gastric secretion and diminished capacity of the remaining segments of the digestive tract for absorption of iron. The slow but progressive increase of erythrocytosis and hemoglobin is due to vicarious hematopoietic function of the digestive tract, especially the duodenum and the small intestine. The improvement of the condition of the blood after gastric resection is spontaneous. The author's patients did not receive any treatment for the control of anemia. According to the author, the value of gastric resection in the treatment of gastric cancer or peptic ulcer is obvious. He advises certain medical treatments which may result in a better absorption of iron by the body soon after gastric resection, to stimulate the antianemic reaction of the remaining segments of the digestive tract.

### Rivista di Patologia e Clin d Tuberculosis, Bologna

11 897 988 (Dec 31) 1937

- Chronic Nodular Pulmonary Tuberculosis M Anzalone—p 897  
Lipases of Blood of Animals Treated with Parenteral Injections of Bees wax Experiments G Tosi—p 922  
\*Diiodotyrosin (3,5-Diiodo 4-Oxyphenylalanine) in Treatment of Pulmonary Tuberculosis G L'Eltore and G Scoz—p 933  
\*Hypoglycemia and Symptoms of Intolerance to Intravenous Injections of Calcium M Mazzetti—p 940  
Intrapleural Injections of Sterile Olive Oil Unverricht's Technique at Beginning of Pneumothorax in Prevention of Parapneumothorax Pleurisy F Ravazzoni and C Croce—p 951

**Treatment of Pulmonary Tuberculosis**—L'Eltore and Scoz say that, if a disease, infection or nutritional disturbance coexists with pulmonary tuberculosis and is controlled, the evolution of tuberculosis greatly improves, especially if the diseases are closely related. The authors administered 3,5-diiodo 4-oxyphenylalanine to six patients having pulmonary tuberculosis with slight hyperthyroidism. All patients in the group were under weight, had lability of the sympathetic nervous system and a cardiac rhythm more frequent than normal and showed signs of hyperthyroidism. The dose varied from 0.05 to 0.15 Gm and was administered at intervals varying from three to five weeks, according to the action of the substance on the cardiac rhythm until from nine to twenty-three injections had been given. The clinical and roentgen examinations of the

patients showed no aggravation of the tuberculosis. All the patients gained in weight. Their general physical and psychic condition and appetite improved. However, the treatment is symptomatic; the patients lose weight some time after its discontinuation and regain weight as soon as the treatment is given again. According to the authors, the preparation specifically antagonizes hyperthyroidism. Its effects may be due to the iodine that is contained in the substance. The treatment is well tolerated and harmless if given with caution as to the dose and intervals.

**Hypoglycemia and Intolerance from Calcium**—Mazzetti studied the effects of intravenous injections of calcium on glycemia in a group of fifty-one patients who were suffering from pulmonary tuberculosis. The group included three tuberculous patients with diabetes. The author concludes that the intravenous injections of 10 cc of 10 per cent solutions of different salts of calcium diminishes glycemia in the majority of cases. The diminution varies from 0.15 to 0.3 mg of sugar per thousand cubic centimeters of blood. Lower values of hypoglycemia due to injections of calcium are exceedingly rare. In a few cases there is a moderate increase of glycemia, which varies from 0.09 to 0.34 mg per thousand cubic centimeters of blood. The diminution of glycemia takes place within fifteen or thirty minutes after the injection of calcium solution and rarely after forty-five or sixty minutes. Three patients in the author's group who had diabetes showed low glycemic values and did not show symptoms of hypoglycemia and intolerance to calcium. Another group of thirty-six patients reacted with the symptoms of intolerance to an intravenous injection of 5 cc of a 10 per cent solution of calcium gluconate. The author does not believe that the intravenous injection of calcium induces the syndrome of intolerance to calcium. He believes that the so-called late symptoms of intolerance to calcium are caused by faulty preparation of the solution to be used for the injections. The reason why the solution induces the development of symptoms of intolerance is not known.

### Klinische Wochenschrift, Berlin

16 1809 1824 (Dec 25) 1937 Partial Index

- Pathogenesis of Rhinogenic Meningitis L. Burkhardt—p 1809
- \*Xanthoprotein Content of Blood in Patients with Rheumatism F. Knüchel—p 1810
- Further Investigations for Demonstration of Biologic Actions of Irradiated Electrolyte Solutions by Means of Schultz Dale's Method S. Wolfram and O. Ried—p 1811
- \*Late Electrocardiographic Diagnosis of Myocardial Infarct by Means of Thoracic Lead F. Kisch—p 1812
- Takata-Ara Reaction (One Glass Method) for Neurosyphilis in Ambulatory Practice M. Kraus—p 1815
- Demonstration of Bile Acids by Determination of Surface Tension A. Müller—p 1817

**Xanthoprotein in Blood in Rheumatic Patients**—Knüchel points out that although the importance of focal infection for the genesis of rheumatic disorders is recognized, it has not been explained why the rheumatic disorder settles in some cases chiefly in the joints of the extremities and in others in the vertebral joints. The author is convinced that endogenic factors have a part in this localization. Studies on ochronosis revealed that homogentisic acid and many other phenol bodies have a high degree of chondro-affinity. Thus it seems justified to search for phenol-like substances in patients with rheumatism. Since large quantities of blood are required for the detection of phenol bodies, the author used a group reaction for the phenol bodies, namely the xanthoproteic reaction. Tests on rheumatic patients and on healthy persons revealed no essential differences in the xanthoprotein values of the two groups. However, in a certain type of rheumatic disease, namely, Bechterew's disease (spondylitis deformans) the xanthoprotein values are from one-fourth to one-third higher. This increase is demonstrable before characteristic symptoms develop. This new method for an early diagnosis of spondylitis deformans is of great value in that treatment is of little avail during the later stages of the disease. An increase in xanthoprotein values is not always an indication of spondylitis deformans; it may result also from renal insufficiency and after prolonged medication with large doses of aminopyrine, but under these conditions the values are usually so high above the normal that an error can be avoided. The demonstration of an increase in the xanthoprotein content of the blood is not only of value for the diagnosis of

spondylitis deformans but also throws some light on the pathogenesis of the disorder. He suggests that an increase in the phenol bodies, by virtue of their chondro-affinity, may cause a reduction in the resistance of the synchondrosic apparatus and, on the basis of reduced resistance, a focal infection may elicit the characteristic changes of spondylitis deformans. The cause of the increase in the xanthoprotein content of the blood has not been explained. The favorable therapeutic effects that have been obtained with dietetic measures, particularly with protein deficient diets, could be in accord with either an intestinal or a renal origin.

**Electrocardiographic Diagnosis of Myocardial Infarct**—Kisch cites investigators who demonstrated the value of electrocardiography in the diagnosis of cardiac infarct but shows that the customary leads from the extremities may fail to disclose the presence of a cardiac infarct. The introduction into electrocardiography of the thoracic leads, in addition to the customary leads from the extremities, has reduced the possibility of a cardiac infarct escaping detection in the electrocardiogram. There is no agreement as to which type of thoracic lead should be employed and the multiplicity of methods results in confusion. To avoid this confusion, he recommends indicating what type of thoracic lead has been employed. Scherf suggests that the most suitable thoracic lead is that "from the left leg to the region of absolute cardiac dullness" (electrode of the left arm attached to the left leg and the electrode of the left leg applied to the area of absolute cardiac dullness). Thus he designates as lead 4 and, to identify it more exactly, he adds in parentheses the initial letters for the leg and the heart. He concludes that, whenever there is the slightest suggestion of myocardial impairment, the thoracic lead should be taken in addition to the customary leads from the extremities. He cites case histories which indicate that, if this thoracic lead is taken, the electrocardiogram will reveal even cardiac infarcts that developed years ago. In the suggested cardiac lead an old myocardial infarct of the anterior wall is indicated by a barely suggested initial R of the beginning deflection or by its complete absence and by a high onset and arc-like downward course of the terminal deflection, which occasionally ends in a negative wave.

### Munchener medizinische Wochenschrift, Munich

84 2009 2048 (Dec 17) 1937 Partial Index

- \*Influenza und Tuberculosis J. E. Kayser-Petersen—p 2009
- Practical Results of Functional Test of Lung in Treatment of Pulmonary Tuberculosis W. Vorwerk—p 2011
- Multiple Cartilaginous Exostoses and Their Hereditary Transmission B. H. Wiebeck—p 2013
- Reform of Social Insurance in Germany New Organization of Sick Insurance K. Haedekamp—p 2016
- Experiences with Ulcer in Staphylococcal Infections G. Killmer and A. Nehrkorn—p 2021
- Treatment of Fulminating Purpura During Infectious Diseases Particularly During Scarlet Fever E. Puschel—p 2030
- \*Infections with *Bacillus Funduliformis* with Especial Consideration of Pleural Disorders W. Brunner—p 2032

**Influenza and Tuberculosis**—Kayser-Petersen shows that the influenza which complicates an active or inactive tuberculosis generally takes a favorable course, to be sure, the course may be the more unfavorable, the more severe is the influenza and the more serious and extensive is the tuberculous process. Discussing the action of the influenza on the tuberculosis he says that in most cases the tuberculosis is not unfavorably affected; however, here too exceptions are possible, that is a turn for the worse may take place if either one of the processes is especially serious. In most cases in which it was believed that tuberculosis developed following influenza the disorder in question was not influenza at all but rather an influenza like acute onset or exacerbation of a tuberculous process. For this reason it is less important from the practical point of view to protect tuberculous patients against influenza than to think of tuberculosis and search for it by examination of the sputum and by roentgenoscopy, in all cases of so-called influenza.

**Infections with *Bacillus Funduliformis***—Brunner surveys the clinical significance of *Bacillus funduliformis* which belongs to the large group of anaerobic gram-negative bacilli which do not form spores and which normally occur in the cavities of the human body. It has been found that *Bacillus funduliformis* may enter the blood stream without accompanying bacteria and may cause severe general infections with suppurat-



ing metastases in the lungs, liver and joints. The portal of entry in adults is generally an angina and in children an inflammation of the middle ear. In contradistinction to infections that are caused by the ordinary pyogenic organisms, those caused by *Bacillus funduliformis* usually do not involve the endocardium, spleen and kidneys. Another characteristic of infection with *Bacillus funduliformis* is that in the beginning a massive necrosis of the parenchyma of the organ develops and that the invasion by leukocytes follows secondarily. The author describes three cases of his own observation in which *Bacillus funduliformis* had caused pleural empyemas. In contradistinction to the cases reported in the literature, these were not accompanied by a sepsis. Such cases have from the beginning a favorable prognosis because they have a tendency to encapsulation and because the primary disease, which is responsible for these forms of empyema, usually remains in the background. Under these conditions the infections with *Bacillus funduliformis* are not readily differentiable from common pyogenic infections. Such cases demonstrate again the great importance of a careful bacteriologic examination for the estimations of surgical infections. It reveals that even strictly anaerobic, nontelluric bacilli are disseminated by the blood stream and are the causal agent of metastases more frequently than was assumed formerly.

### Zeitschrift f d ges experimentelle Medizin, Berlin

101 585 782 (Nov 15) 1937 Partial Index

- Studies on Coagulation of Blood with Especial Consideration of Hemophilia W Grunke—p 585  
\*Investigations on Division of Blood Sugar Between Blood Corpuscles and Blood Plasma Under Normal and Pathologic Conditions. Also Contribution to Spontaneous Hemoglycolysis P Larizza—p 597  
Chemical Composition of Leukocytes in Human Blood P Larizza—p 615  
\*Anemia in Rats After Administration of Excessive Amounts of Vitamin A W Papke—p 648  
Action of Water Tolerance Test on Elimination of Creatinine and Solid Constituents (Dry Residue) of Wine F v Kruger—p 666  
\*Etiology of Idiopathic Hydronephrosis W Tomoff—p 701  
\*T Wave in Electrocardiogram of Children H Reme—p 729

### Blood Sugar in Blood Corpuscles and in Blood Plasma

—Larizza shows that under normal conditions the blood corpuscles contain less blood sugar than does the blood plasma but that the distribution of the blood sugar between these two elements of the blood varies greatly. It was found that the average distribution coefficient is 0.83. The blood of diabetic persons shows no essential deviation in this respect. To be sure, the quantity of sugar in the erythrocytes is greater in diabetic than in normal persons, but the percental distribution between the erythrocytes and the plasma is about like the average. Of the various pathologic conditions, leukemias show the severest changes, for in these the concentration is about the same in the corpuscles and in the plasma, or the corpuscles may even have a higher content than the plasma, that is, the coefficient of distribution may be reversed. The blood corpuscles of patients with heart disease who have cyanosis show a tendency to increase their sugar content, whereas in patients with uremia and in many of those with cancer the reverse tendency is demonstrable. In sterile, normal blood that is kept at room temperature, the sugar content gradually decreases. In the course of ninety-six hours it gradually loses its reducing substances, and the portion of reducing substances which is not destroyed consists of substances other than sugars. In the plasma that remains in contact with the blood corpuscles, the destruction of the sugar is rather rapid, this is probably the result of a closer contact with the leukocytes. Serum that is in contact with the blood clot likewise has glycolytic power, but in this respect its capacity is inferior to that of the whole blood or of the plasma. Plasma and serum that are free from blood corpuscles are inactive in this respect and may even show an increase in reducing substances. Blood from diabetic patients behaves in general like normal blood. To be sure, during the same period much greater quantities of sugar are decomposed in diabetic than in normal blood. This indicates an increased glycolytic power. Blood from patients with leukemia has a greatly increased glycolytic capacity.

**Anemia After Excessive Amounts of Vitamin A**—Papke directs attention to the fact that other investigators had observed that the administration of large doses of vitamin A results in a progressive anemia. He decided to verify this. The experimental animals were growing rats. The vitamin A

was given in the form of an oily preparation which, in addition to vitamin A (40,000 biologic rat units per cubic centimeter), contained also vitamin D (3,000 rat units per cubic centimeter). The solvent for the two fat-soluble vitamins was an oil. This oil without the vitamins was given to the controls. The administration of large doses of the vitamin oil solution (0.5 to 2 cc daily) produced pathologic changes in young rats (from 4 to 6 weeks old) but failed to do so in rats that were 6 months old. The development of a progressive hypochromic anemia with hyperplasia of the marrow could be verified. The behavior of the reticulocytes in the circulating blood indicated an inhibition in their elimination from the bone marrow, and changes in the bone marrow indicated that there was a disorder in the process of maturation. There were no hemosiderin deposits in the spleen. Other disorders that were observed in the rats were diarrhea and spontaneous fractures. Moreover, the leukocytic blood picture showed a deviation from the lymphatic to the myeloid. Necropsy revealed no inflammatory changes in the internal organs. The anemia is probably a result of the toxic action of vitamin A on the bone marrow. A possible influence of the vitamin D is considered.

**Etiology of Idiopathic Hydronephroses**—To clarify the etiology of the so called idiopathic hydronephroses, Tomoff made experiments on dogs. His studies revealed that the disturbance of the ideal functional harmony between the different parts of the urinary passages is the primary cause of hydronephrosis. In his experiments the author induced this disturbance by denervation of the renal pelvis and of the upper part of the ureter, for this denervation disrupted the functional equilibrium. The author thinks that this factor and the changes that, following the paralysis, develop in the wall of the renal pelvis cause a dilatation of the renal pelvis and of the calices and thus lead to hydronephrotic conditions. He says that pyelograms and the macroscopic and microscopic investigations corroborate his assumption. He further investigated the significance of the fibrous capsule for the development of the hydronephroses. His experiments proved that a congenital or acquired weakness of the elastic fibrous capsule is to a certain extent responsible for the development of hydronephrotic conditions, for this capsule is important for the preservation of the equilibrium of the intrarenal pressure.

**T Wave in Electrocardiogram of Children**—Reme states that Wilhelm Trendelenburg observed several years ago that in an entirely normal child the T wave was negative in lead 3. He suggested that this was probably due to the fact that the heart was located higher up in the thorax and that thus the center of the attachment of the left arm was not above but below the iso-electric line for the T wave. Reme made further investigations on this problem and found that in children without cardiac defects the T wave in lead 3 may be negative but that as the children grow older it becomes positive. In children in whom  $T_2$  is positive when the arms are in the customary position  $T_3$  can be made negative by pulling the left arm downward. When the left arm is pulled up, the positivity of  $T_3$  becomes stronger than is the case when the arms are in the usual position. This seems to suggest that the T wave in lead 3 may become negative with the ordinary position of the arms when during early childhood the heart is still somewhat higher up in the thorax than is the case later on. The author points out further that changes in the form of the P wave which are observed in case of negativity of  $T_2$  can be explained in the same manner. If the left shoulder is pushed higher and the site of the lead is thus located higher up on the thorax, the P wave assumes the normal outline.

### Wiener Archiv fur innere Medizin, Vienna

32 146 (Jan 31) 1938

- Vascular Spasms Caused by Digitalis E Schill—p 1  
\*Pulmonary Tuberculosis in Diabetes Mellitus W Pilgerstorfer—p 7  
\*Significance of Demonstration of Intestinal Hemorrhage for Diagnosis of Carcinoma of Caudal Part of Pancreas O Ruml—p 21  
Transition of Hypochromic Resection Anemia Into Pernicious Anemia. K Buchgraber and H Fleischhacker—p 33  
Interrelations Between Throid and Female Sex Organs J Adler Monnich and R Tiberti—p 41

**Pulmonary Tuberculosis in Diabetes Mellitus**—Pilgerstorfer studied the cases of diabetes mellitus in the first medical clinic of the University of Vienna from 1923 to 1936. Of the 1,208 patients with diabetes mellitus, seventy-one, or



58 per cent, had also pulmonary tuberculosis. Treatment with pneumothorax produced favorable results in patients with early infiltrates, however, the pneumothorax had no noticeable influence in the more advanced cases. Insulin treatment had no decisive influence on the course of the pulmonary tuberculosis in the diabetic patients. Administration of insulin did not prolong the average life span of diabetic patients who received a diet with low carbohydrate content. The author found that the diet with high carbohydrate content is the most valuable therapeutic method for diabetic patients with pulmonary tuberculosis. The protein and fat content of the diet seems to be of no decisive significance for the prognosis. The author reaches the conclusion that the life expectancy of the diabetic patients with pulmonary tuberculosis is much better with a diet of high carbohydrate content than with a diet of low carbohydrate content.

#### Intestinal Hemorrhages in Carcinoma of Pancreas—

Riml reports three cases in which carcinoma of the caudal portion of the pancreas was demonstrated either by necropsy or by biopsy. All the patients had hemorrhages into the gastrointestinal tract. There were hematemesis, melena and colics in the epigastric region. The author suggests two possible explanations for the gastrointestinal hemorrhages that accompany carcinoma of the caudal portion of the pancreas. 1. They may be due to diapedesis from congested, varicose veins of the mesenterium, stomach or duodenum. Necropsy in two of the cases revealed that the pressure of the primary tumor or of its metastases against the mesenteric root may readily cause such stasis and diapedesis. This mechanism is especially probable in late hemorrhages, that is, in those developing during the advanced stages of pancreatic carcinoma. 2. The hemorrhages into the intestine may be caused by intrapancreatic hemorrhage with discharge of the blood through the pancreatic duct. To be sure, in the two cases that came up for necropsy such hemorrhages could not be proved. The author suggests, however, that such hemorrhages should be looked for at necropsies. He emphasizes that in case of occult or manifest melena, particularly if it concurs with epigastric colics and if no source of hemorrhage can be found in the gastrointestinal tract (absence of enteritis and negative roentgenogram of the gastrointestinal tract), the possibility of a carcinoma of the caudal portion of the pancreas should be taken into consideration and an exploratory laparotomy should be made.

#### Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

S2 173 256 (Jan 8) 1938

- Asphyxia Neonatorum I C Beker—p 174  
 Dermoid Cyst of Floor of Mouth B W L Siemens—p 179  
 Catamnesic Data on Schizophrenic Patients Who Have Undergone Shock Therapy A Querido and P A F van der Spek—p 184  
 Results of Psychoanalytic Treatment J H van der Hoop—p 190

**Schizophrenia After Shock Therapy**—Querido and van der Spek report observations in the after-care of schizophrenic patients who have undergone shock therapy. They give tabular reports of their observations in nineteen cases listing the age of the patients, the symptoms before the treatment, the type of shock therapy used (insulin or metrazol injections or the combined use of the two substances) and the mental and physical status after the treatment. Regarding the mental status the authors say that in most patients inactivity and lack of initiative predominate. Moreover, in many the shock therapy is at first followed by a mild depressive period. When reestablished in their social surroundings, the patients show a behavior which indicates that in general the essential schizophrenic symptoms have not disappeared. It is understandable that the psychiatrists at the clinic in the beginning are satisfied with the results of the shock therapy, for the majority of the schizophrenic symptoms, such as hallucinations, illusions, anxieties and motor unrest, disappear. The patient becomes apparently social. However, this improvement is only apparent. It is followed by a wavering attitude, lack of activity and lack of initiative. That is the patient is not more social but merely more submissive and particularly the lack of the characteristics which in the beginning stimulated cure lead to the disappointment of the optimistic expectation.

#### Hospitalstidende, Copenhagen

SO 1357 1380 (Dec 28) 1937

- \*Prognosis of Recent Cavity on Conservative Treatment S Cold—p 1357

**Prognosis of Recent Cavities on Conservative Treatment**—In nineteen (40 per cent) of forty-eight cases of recent cavities in which ordinary sanatorium treatment was administered and which were observed for seven years or more Cold reports good results, and in twenty-nine (60 per cent) poor results. Women, especially young women, predominated in his material. He says that the prognosis seems the same for the two sexes and independent of the localization of the cavity within the lung, or whether in the right or the left lung. The results were more favorable in the twenty-seven cases of unknown source of infection than in the twenty-one with a known possible source of infection, in which exposure to more massive infection was presumably greater. In fifteen of the nineteen cases, in which the condition was nonbacillary at the end of treatment, and in only two of the twenty-five cases in which the condition was bacillary more than a year, late results were good. The course was unfavorable in patients having fever for more than two months. A comparison between the forty-eight cases of recent cavities and twenty-nine cases of more chronic cavernous phthisis of corresponding extent from the same period in which conservative treatment was also given and observed for seven years showed that patients who died or patients transferred for collapse treatment numbered 50 per cent of the first group and between 75 and 80 per cent of the second group.

#### Ugeskrift for Læger, Copenhagen

100 128 (Jan 6) 1938

- \*Treatment of Acute Nephritis C Holten—p 1  
 Features of Clinic of Endometriosis C Aaberg—p 6  
 Seasonal Variations of Cevitamic Acid in Serum E Trier—p 10  
 Weil's Disease Without Cardinal Symptoms I Knudsen—p 14

**Acute Nephritis**—Holten says that rest in bed is the best means for avoiding the greatest danger that threatens the patient with acute nephritis, namely, chronic nephritis. His principle is to keep the patient with acute hemorrhagic nephritis in bed until the urine is free from albumin and until ordinary careful microscopic examination made at least twice at a week's interval shows the urine to be without erythrocytes, a further requirement is that the creatinine test shows normal renal function. He believes that in by far the largest number of cases recovery is possible if the patient is admitted early in the disease and kept in bed as stated. He asserts that recovery is possible even if the erythrocyturia persists for more than three months, as long as sedimentation and function tests disclose a tendency to improvement. By 'recovery' he means that at least one-half year after discharge the urine is chemically normal on several examinations or chemically and microscopically normal on one examination. Of his fifty-two patients treated from 1932 to May 1937, including twenty-seven children under the age of 15 years, forty one are well, three have rest albuminuria, three have chronic nephritis, two are dead from exophthalmic goiter and anuria respectively, and information is incomplete in three. He feels that there is a sure occurrence of recovery of about 75 per cent. Six of his patients were kept in bed for from 115 to 175 days after examination in five from nine months to four years after treatment ended showed them to be well, while the sixth discharged in April 1937 had not yet been examined, all but one of these patients were admitted for treatment less than two weeks after the beginning of the nephritis, one had been ill for five weeks. In the three cases of recurrence repeated bed treatment resulted in recovery in eleven, thirty-eight and sixty days, respectively. The average length of hospitalization for the successfully treated patients was about eighty-four days, the minimum twenty-one days and the maximum 200 days. Of the chronic cases treatment had first been given at home for five months in two and discharge after one month was requested in the third. Of the patients with rest albuminuria two had been sick at home for three and seven months respectively and were not free from erythrocyturia after eight and twenty-five days, one was treated for only ten days.

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## DEMAND AND SUPPLY IN THE LEARNED PROFESSIONS

WALTER M. KOTSCHNIG, PH.D.  
Visiting Professor of Education, Smith College  
NORTHAMPTON, MASS.

The latest report of the president of Harvard University to the Board of Overseers has caused a considerable stir among educators, professional men and women and in the general public. One of the passages most frequently quoted reads that "we are in danger of reaching the condition already so acute on the continent of Europe, where the problem of unemployment in the learned professions demands attention even in countries wracked by political and economic trouble." President Conant by implication ascribes this state of affairs to excessive student enrolments. "No one knows," he says, "how serious is the unemployment of university men, but it seems to me highly probable that a diminution in the total number of students in the universities of this country is desirable."

These statements contain a most timely warning, but the suggestion that student enrolments should be diminished requires further careful analysis. There can be no doubt that in many European countries the learned professions are overcrowded. And it can hardly be denied that this overcrowding is due primarily to the rapid growth in the enrolment of students in professional courses which has manifested itself during the last few decades. The disastrous results of such overcrowding in the professions are equally evident: unemployment and underemployment are all too frequent, professional incomes are on the decline, professional standards are threatened, and, perhaps most important of all, there are large numbers of university graduates who, because they are denied work, are in the vanguard of revolutionary movements which seek a change at all costs. The situation in the United States is not nearly so threatening. In the absence of any nationwide surveys covering all the learned professions—a curious deficiency in a country which abounds with research councils and institutes, with inquiries and surveys and investigations—it is not possible to produce adequate data. Yet in the light of the scanty information available it would appear premature to speak of an overcrowding of the learned professions in the United States at the present time. The hardships suffered by these professions during recent years were largely due to the depression, which spared no occupational group. The comparative ease with which graduates of the last two years have found gainful work may be cited in support of this assumption. Notwithstanding

this situation there is no cause for complacency. The number of students in professional courses is steadily increasing. In several fields it has more than doubled between 1913 and 1937. The total number of students in American institutions of higher learning is today more than three times as large as it was in 1913. So far as can be ascertained there is no learned profession in which the number of graduates seeking admission each year is not considerably in excess of the number of practitioners who die or retire. Thus the number practicing the various professions is growing rapidly and the time seems to be approaching when at least in some professions, such as law and medicine, the saturation point may be reached. President Conant's warning is therefore very much to the point.

His further suggestion that "a diminution in the total number of students in the universities of this country is desirable" is likely to meet with a good deal of opposition. It runs counter to the aspirations of the American people, who have faith in education both as a means of improving their social and economic standing and because they perceive in it more or less dimly a way to a fuller and freer life. That this urge for more and more education has led to an influx of large numbers of poorly qualified students will not be questioned. If this type of student can be eliminated by means of stricter methods of selection it will undoubtedly help to raise the educational level of the institutions of higher learning and will thus by substituting quality for quantity serve the best interests of an enlightened democracy. On the other hand, it is equally certain that there are still large numbers of highly gifted children who for financial reasons are denied access to higher studies. Their number is probably considerably in excess of the number of poorly qualified students who might in the future be eliminated from colleges and universities, to receive an education elsewhere, more in keeping with their natural leanings and abilities. In other words, if truly democratic procedures were applied to admission policies an even larger number of students than we have now might be anticipated. It is for this reason that President Conant's suggestion seems to need amplification. A distinction should be made between those students who embark on prolonged specialized studies which will fit them for a narrow range of occupations and those who seek a liberal education, which, because of its general character, will help their mental growth and understanding of contemporary problems, and will consequently prepare them both for a wide range of occupations and a fuller participation in social life in the widest sense. It would be highly undesirable to apply any limitations to this latter group, provided those who seek admission to liberal studies are intellectually, physically and morally qualified to benefit by them. Society, far from

suffering from an oversupply of graduates, will gain by a larger number of people who are literate in the highest sense

While we have thus to guard against any form of general intellectual malthusianism it is obvious that the problem of specialized professional studies presents itself in a different light. Here it is not only defensible but necessary to establish some balance between the supply of practitioners and the demand for their services. Professional studies are for the most part long and costly. Those who prepare themselves for a learned profession, medicine or law or architecture or electrical engineering, have to specialize to an extent which makes them less adaptable than before. In case of unemployment they cannot be expected to shift easily from their chosen profession to some other occupation. In any case such a shift nearly always involves loss of standing and waste of capital and energy spent on the preparation for work in the profession originally chosen. Changes of occupation should therefore be avoided as far as possible, which means that no more people should be trained for a particular profession than are reasonably certain to be absorbed. The principle is simple and self-evident. Its application, however, raises a host of problems, chief among them the difficulty of determining future demands in the professions.

#### FORECASTING FUTURE DEMANDS

There are five major considerations which ought to govern any attempt to arrive at reasonable estimates of future demands.

1 To begin with, the supply of intellectual labor is inelastic. The period needed to "produce" a candidate for any of the learned professions ranges anywhere from four to ten years. Thus the supply of candidates from four to ten years hence is determined by the number of students entering professional courses today. This time lag makes it imperative that plans be made from four to ten years ahead. This is difficult enough. Such attempts as that of the Committee of Medical Education to predict the probable number of practitioners as far ahead as 1980 are likely to prove futile. At any rate they are unnecessary.

2 The demand for professional services is elastic, i. e., it diminishes rapidly as soon as there is a decrease in the purchasing power of those who avail themselves of professional services, and in many cases out of all proportion to that decrease. While bakers and butchers, dealing in the bare necessities of life, will in times of depression continue to sell their goods though perhaps on a somewhat diminished scale, intellectual workers such as architects, engineers and physicians will be confronted with a rapidly diminishing demand for their services. These services are counted among the luxuries of life to be largely dispensed with as long as the more primitive needs are not satisfied. Obviously the degree of elasticity or the extent to which the demand for professional services shrinks, following a decrease in purchasing power, is not the same for all types of intellectual work. Some professions are more directly subject to economic fluctuations than others. Architects, for instance, and sculptors may in times of depression see themselves completely unable to earn a living since building operations practically cease. The position of dentists and even more so that of the general medical practitioners, is less vulnerable. Yet they will find their patients postponing operations where possible and in many cases consulting them only

when such consultation appears imperative. This is, of course, particularly true in those countries which are not endowed with systems of medical insurance which serve to absorb and mitigate the shocks of an economic depression. However, even where the elasticity of demand is comparatively small, the resulting unemployment in times of depression and the sudden decrease in incomes may easily lead to the mistaken conclusion that a given profession is "overcrowded" and that the further supply of graduates should be curbed. In Germany, for instance, where the National Socialist government imposed a 50 per cent reduction on admissions to higher institutions of learning to fight the unemployment among college and university graduates, it has since become evident that these restrictions have led to a real shortage of young practitioners in more than one profession. This was but to be expected, for the same elasticity of demand which affects the professions adversely in times of depression operates in their favor in times of improving economic conditions. The dammed-up demand for professional services becomes released and offers greatly enlarged opportunities to professional men and women. The lesson to be drawn is that any prediction of future demands should be based on an observation of long-term trends which will make it possible to discount the temporary effects of periods of depression.

3 Taking a long-range view, we must recognize that we are living in a dynamic world which does not stand still. As a result of new technical inventions and changes in the economic organization of the various countries, occupational patterns are continuously shifting. It is therefore altogether inadequate and misleading to base one's calculations of future demands on an estimate of probable openings due to death and retirement only. As a society evolves from an agricultural state to a highly industrialized community with large urban agglomerations, the various professions are deeply affected. Some of them may suffer a decline, as for instance veterinarians whose opportunities have been severely curtailed by the substitution of mechanical traction for animal traction. The general trend, however, goes in the other direction, in a highly industrialized society the demand for professional services, for teachers, engineers and architects is likely to increase. Speaking of this country, Hurlin and Givens have shown in their article on "Shifting Occupational Patterns" in the report on "Recent Social Trends in the United States" that the higher service occupations, including most of the professions, are very much on the ascendant. Higher standards of living and the growing complication of modern life create an additional demand for professional services. Any estimates of future demands which do not take into account this additional demand are likely to err considerably on the conservative side. Most of the predictions made in Europe during the last few years are for this reason erroneous. In parenthesis, it might be added at this point that comparisons from country to country of the ratio of the practitioners of any given profession to the total population are of very problematic value. No valid conclusions can be drawn for instance from the fact that there are less than 500 inhabitants per medical practitioner in this country as compared with more than 3,000 in Yugoslavia. Such a comparison would be useful only if it could be shown that the socio-economic conditions of the two countries are substantially alike. Even if this were true the

figures could be plausibly interpreted to mean not that the United States has too many but that Yugoslavia has too few physicians

4 A distinction has to be made between the need for professional services and the effective demand for such services. If we talk of a prediction of a future demand we have in mind the actual demand likely to be effective at the time for which the estimate is made. These estimates will in most cases be distinct from "optimum numbers." It will be remembered that the Committee on the Costs of Medical Care in the United States attempted to estimate the "optimum number" of physicians required in the United States to provide for all Americans all the medical care deemed necessary by present standards. Such estimates may be misleading, if they are used as a basis for predicting effective demands a few years hence. Their function is rather to help stimulate a latent demand and to pave the way for such measures as will bring the needed services within the financial reach of those who for the moment have to forego them.

5 Finally, agencies set up to study future demands for professional labor should not be composed exclusively of professional practitioners. In addition to representatives of both professional associations and professional schools, they should include experts in economics and in government as well as social workers and other representatives of the public. There are two valid reasons which make it imperative that any "planning commissions" should be so composed as to encourage the broadest possible outlook. The first is that the professional prospects in one field depend to a large extent on the general evolution of the occupational pattern in any given country. Valid forecasts can be made only if, as has been pointed out, the state of the general market for human labor is taken into account. It is not possible to make worth while predictions regarding the prospects in the field of teaching or medicine without a close analysis of occupational trends in general. Ideally, it would seem desirable to entrust the complicated business of occupational orientation to some broadly constituted national agency, either public or private, which would observe continuously the condition of the labor market, paying special attention to shifts in the demand for professional services. Such a solution may for a long while remain utopian, but *faute de mieux* care should be taken at least that no attempts to predict future demands for professional services should be made without drawing heavily on the advice of trained experts in the social sciences. A beginning has been made in this country by the Committee on the Costs of Medical Care and by the Commission of Medical Education. More helpful because more comprehensive are the studies recently made by Sven Wicksell and Tor Jerneman in Sweden, by the Limburg Commission in Holland, and by the Sapru Commission in the United Provinces in India. These inquiries, which were both publicly and privately supported, covered the entire professional field. It is to be hoped that their *ad hoc* studies will lead to the establishment of permanent professional orientation commissions on a nation-wide basis.

A further reason why the forecasting of future demands should not be left to the professional organizations alone is that such a procedure exposes them to the charge of being all too conservative in their prediction of future demands. They are accused of attempting to keep student enrolments too low in order to keep the supply for the professions artificially small, with a view

to maintaining monopoly prices. This danger would be avoided and the professional organizations would not be subjected to unjustified or exaggerated criticism if the collection and compilation of facts and the forecast of future needs were left to obviously impartial agencies.

Occupational planning as here conceived is no easy matter. If it is ever to become more than sheer guesswork or a utopian dream, it will require vastly improved occupational statistics. It will have to make the fullest possible use of whatever tools economic theory may supply. Indexes of prices and wages, of production and consumption, will have to be consulted. National attitudes and the evolution of social organization will have to be observed. Above all, creative spirits will be needed, men who can separate the important from the ephemeral, experts certainly but also social philosophers. They will need vision and initiative. They will also need patience, for much of their work will be vitiated by forces beyond men's ken or control. Yet, while their predictions will never be foolproof, their data regarding the future demand for the various types of professional work ought to be sufficiently trustworthy to allow for the elaboration of sound admission policies.

#### BALANCING SUPPLY AND DEMAND

Any attempt to restrict student enrolments in professional schools should as far as possible serve to adjust the supply of intellectual workers to the probable demand for their services. This does not mean that there are no other considerations which might prompt a policy of limitation. Thus, those professional schools which are increasingly applying restriction policies—chiefly the medical schools and engineering colleges of such countries as the United States, Scotland, Norway, Finland and Poland—have on the whole justified their action on the ground that their facilities were limited and that high educational levels could be safeguarded only if admissions were in keeping with available places in laboratories, dissecting rooms, and so on. No doubt, this argument is sound. Quality must not be sacrificed for quantity if high professional standards are to be maintained. Yet one cannot help feeling that this argument calls for an extension of professional schools rather than for a limitation of enrolments, provided it cannot be shown at the same time that the supply of young graduates is in excess of the demand for them. In other words, and in the last resort, it is the demand rather than the material equipment which ought to determine the number of students to be admitted.

If it can be shown that a profession threatens to become overcrowded, i. e., that the supply of new applicants for admission clearly exceeds the permanent or long range demand, various ways are open to achieve an adjustment. One is to eliminate marginal institutions. This will serve both to decrease the number of students and to raise educational levels. The magnificent work accomplished by the American Medical Association and the Association of American Medical Colleges in bringing about the closing of poorly equipped medical schools often run for private profit is too well known to need elaboration here.

Another method is to raise admission requirements. Here again the medical schools of this country lead the way. Their demand that every prospective medical student should spend at least two years in a liberal arts college has been one of the chief forces in the raising

of the medical profession to new levels. Besides, the college record offers most valuable indications for the selection of students for medical schools. A serious drawback of this policy, however, is that it prolongs the period of study and increases the cost to the student. This objection also applies to another way of decreasing enrolments—that of raising tuition fees. Either step, unless accompanied by an increase in available scholarship funds, may well lead to the elimination of some of the best students.

Yet another method of decreasing student enrolments is to enlighten the public about the lack of opportunities in any given profession, provided such a lack can be conclusively demonstrated. That the public is to some extent guided by the prospects in the various professions has been evidenced in numerous countries. Germany, for instance, some twelve years ago, had a shortage of dentists which resulted in a regular flood of new students of dentistry: 1,053 in 1925, 3,274 in 1928, 4,541 in 1929, and 5,417 in 1930. Similarly the pressure on the American medical schools is undoubtedly caused, at least in part, by the fact that the public is misled in believing that incomes in the medical profession are unusually high or, in other words, that this profession offers unusual opportunities. Theorists who operate with such notions as "average yearly incomes" or "average net life earnings" very often seem not to be aware of the fact that their tables are vitiated by the existence of a comparatively small number of very large incomes which weigh all too heavily in the establishment of average figures. Nor do they seem to realize that the top incomes in the learned professions are bound to be higher than in other occupations, because the public is prepared to pay a higher price for high quality in professional service. One may take issue with such pseudoscientific procedures even if it could be proved—a question obviously outside the scope of this paper—that the actual cost of medical care to large numbers of people is too high. In place of using income figures of very doubtful value, it would be more to the point if the public were periodically provided with well founded information about future demands as determined by professional orientation agencies. To be effective, such information should cover as large a number of professions as possible, for it is not enough to issue warnings without at the same time pointing the way to those professions or occupations which still need additional workers.

Methods hitherto discussed have the virtue of lacking the element of constraint or bureaucratic regulation. They also involve a minimum of "blueprinting." Their possibilities have by no means been fully exhausted. Their integral application is likely to go a long way toward establishing a better occupational distribution. On the other hand, it is, of course, perfectly conceivable that for a time at least more stringent measures may need to be taken to adjust supply to demand. In other words, occasions may arise in the future, as they have done in the past in which it will become necessary to impose numerical restrictions on new admissions. For reasons which have already been stated such a policy can be fully justified, provided it is inspired by the sole desire to uphold professional standards and to save prospective students from unemployment and disillusion. To attain these ends two conditions must be fulfilled. To begin with, numerical limitations will be effective only if imposed by all professional schools of a given type which exist in a given country. Limita-

tions in a single school might be upheld on the ground that educational facilities in that school are limited but they would be ineffective in establishing a balance between supply and demand on the national labor market, they would only shift the source of supply to other and possibly inferior schools. In a country where higher education is under government control, as is true in most countries on the European continent, such a general limitation can easily be enforced. In such countries as England or the United States, on the other hand, it presupposes joint action on the part of the various independent schools. Perhaps only the medical schools in the United States have reached sufficient stabilization and organized cooperation to make such procedure possible. The other condition is that the stricter selection necessary to reduce the number of applicants be made entirely on the basis of proved scholarship. It is neither in the interest of higher learning and professional standards nor to the benefit of the public, if the selection is guided by narrowly nationalistic or racial considerations. This, however, is unfortunately the case in Germany and its eastern and southern neighbors. "National reliability" or membership in a party are poor criteria by which to choose future professional men. It is held by some that a similar trend is becoming evident in this country. Having witnessed the disastrous effects of such policies on professional achievements and public morals in Europe, I can only hope that they are in error. Selection ought to be made on the basis of college records. Where no college degree is required for admission to professional courses, the introduction of a trial year might be contemplated. A proposal for such an "année propédeutique" made a few years ago by Senator Georges Portmann, professor in the faculty of medicine at Bordeaux, was unfortunately rejected.

One final word. Voices have been raised in responsible quarters here and there which predict both for colleges and for professional schools a substantial fall in enrolments within the next few years. This prediction is based on the fall in the birth rate, which has already resulted in a substantial diminution of enrolments in elementary courses and junior high schools. The conclusion drawn is that there is therefore no need to envisage any measures intended to guard against an overcrowding in the professional schools and in the professions themselves. This conclusion I believe to be altogether unfounded. As I have already said it must not be overlooked that there is still much latent talent in the younger generation, which has so far been prevented by financial reasons from finding its way into the institutions of higher learning. Even in this country of "equal opportunity for all" large families still find it very difficult to afford a higher education for their children. The fall in the birth rate and vital statistics indicate that the number of small families is increasing. Colleges and universities are therefore becoming more easily accessible to a larger number of families, and an increase rather than a decrease in student enrolments is to be anticipated. If this assumption which I have attempted to elucidate elsewhere<sup>1</sup> is correct we must look to the enlightened judgment and the intelligent action of university authorities, professional organizations and the state legislatures to determine whether the American dream of a fuller life through education becomes reality or ends in disaster.

Smith College

<sup>1</sup> Kotschnig, V. M. Unemployment in the Learned Professions. *Yale Office of University Research*, 1937, 15: 33-41.

## THE RURAL HOSPITAL

AN EDUCATIONAL CENTER

LESTER J EVANS, MD

Medical Associate the Commonwealth Fund

NEW YORK

I want to discuss a way in which the rural community hospital may serve in postgraduate medical education and the continuing education of the physician. I say "may" advisedly because I do not believe that rural hospitals, generally, have fulfilled their function in this respect. Since the educational character of the small hospital is dependent, in large part, on the nature of its organization, much of what follows has to do with the administration of the small hospital. Indeed it is difficult to separate the purely educational activities from the administrative. These two phases of hospital organization are dependent on each other—anything that is done in the interest of good administration is good education, and what is done for the sake of education is good administration. A competent superintendent is just as important in education as the study of better diagnostic methods by the staff.

When I speak of the community hospital I use the term to define a hospital which is effective in providing, so far as possible, the variety of services and facilities, and the means for their ready use, which contribute to an all round medical service to the whole community, and to distinguish it from the proprietary institution with its usually limited community responsibilities or from the nonproprietary hospital which falls short of well rounded service.

The rural community hospital may be of variable size, depending on many factors: the density of population, the distance from other hospitals, the local conception of the quantity and variety of services needed and, last but not least, the financial ability of the community to underwrite its own medical services. It is one which opens its doors to all reputable physicians and offers its services to all citizens. If properly conducted, it will not break even financially on the income from patients, the community must in some way make up the difference between this income and the operating expense. The acceptance of this obligation stamps the hospital and the services it renders as a matter of community concern. The adequacy of its administration and of its professional services will be determined in part by what the community demands of it and of the physicians who compose the medical staff. The hospital and the staff, in turn, may demonstrate to the community the kind of professional service it should have and demand the necessary support to develop it. The appreciation of this mutual responsibility—the community to the hospital and the hospital to the community—does much to develop the kind of hospital I am discussing. Without the community's generous support it will not become an educational center.

The doctor grows through his persistent effort to do the best he can for his patients and to compare his results with a standard, one which he must formulate for himself from his own experience and from that of others—his immediate associates and those speaking from more advanced positions in the field of medical knowledge. The advent of the hospital gives greater incentive and opportunity for such growth. The doctor finds it possible to join with his fellows in the study

of their common problems and from their efforts will gradually evolve what may be recognized, if it must be given a name, as an educational program.

But this will happen only if the community has provided the kind of hospital that is conducive to such development. It is this kind of hospital which I wish to describe. In doing so I should like to draw on the experience of the institutions established under the hospital program of the Commonwealth Fund during the past ten years. No doubt the assistance which the fund has given these new hospitals has been a factor in permitting them to develop more rapidly in certain respects than might otherwise have been expected, but what they have done can be accomplished with local resources in many communities if there is the desire to do so and a definite program of action. All can point to examples of such accomplishment, but in small communities it is still the exception rather than the rule.

## ADMINISTRATIVE ORGANIZATION

Good hospital organization is manifested, on the one hand, by an active and informed hospital board which fairly represents the community, provides an adequate plant and administrative personnel and adjusts the program to meet the needs of the community, on the other, by a staff which recognizes its responsibility to give the best possible professional service—one which does not remain stationary but moves steadily forward with advancing medical knowledge and techniques. These two groups, the board and the staff, laymen and doctors, will determine what the institution is to do and how, in terms of facilities and personnel, this is to be done, and whether it will become, through the scope and quality of its service, an educational center for those working in it.

In the group of hospitals I have mentioned the eligible physicians appointed to staff membership by the board are designated "associate" or "visiting" in accordance with their individual desires and qualifications. The visiting members take care of the indigent or service patients admitted to their respective services, which in the small hospital can be divided into medicine, obstetrics and surgery. Services in the medical and surgical specialties are established only when there are physicians qualified in the designated fields. All staff members, associate and visiting, take care of their private patients except when major surgery or some highly technical diagnostic or therapeutic procedures are involved—for example, cystoscopy or pneumothorax—which are done only by staff members designated by the board as qualified. Such limitation of privileges is not only fair to all members of the medical staff and the patients but is evidence to the public that the hospital insists on a good standard of service.

To assist with the clinical work by performing the duties usually incumbent on such a position, there is appointed in each hospital a resident physician, a man with one or preferably two years of good intern training, professionally mature enough to be able to work without detailed supervision. Just as in the larger hospital, he is responsible to the hospital administration in all matters pertaining to his nonclinical activities and to the attending physicians in all those pertaining to the care of patients. Some may question whether such a residency is good training for a young medical man, but, for the right man, particularly one who expects to engage in small community general practice and who is not looking for specialized training, I believe the experience is worth while. He sees the



run-of-the-mine medical work of the small community and learns how to do good work without all the highly specialized facilities which he may have had in training. While he learns he gives. From his fresh contact with the newer things in medicine he brings methods of examination, suggestions for therapy and a knowledge of technical procedures which are of help to those with whom he works.

The technical services that can be provided in the small hospital include dietary supervision, anesthesia, a pharmacy, a clinical laboratory, surgical pathologic service and x-ray service. It is true that the hospital of only a few beds cannot expect to have all these, and this is a valid reason for discouraging the very small institution. Parenthetically it may be remarked that in many communities and rural regions the resources, both financial and professional, that have gone into too small, ill equipped hospitals might well be pooled for the support of a larger and more adequate institution to serve a broader area which could provide these services. The remote, sparsely settled community, where even this is impossible, may have to look to some outside sources of assistance to carry the proportionately higher cost of maintaining the minimum essentials of good hospital service.

In the hospitals that I am describing, a full-time trained dietitian is in charge of all general and special diets. Anesthetics are given by a full-time nurse anesthetist who, in some instances, is also supervisor of the operating room. The pharmacy is stocked from a more or less standardized list of drugs and biologicals set up by the medical staff. A full-time technician, preferably one with university training, is employed in the x-ray and clinical laboratory departments. The professional supervision of the x-ray department is given by a part-time, trained roentgenologist, that of the clinical laboratory by some other staff member, if there is one who is qualified for this responsibility. The equipment of these departments is sufficiently complete to permit all ordinary examinations. No attempt has been made to provide facilities for high voltage roentgen therapy, for until there are trained x-ray therapists in small communities this is one of the things that the small hospital should not attempt. Consultants are employed, in occasional instances, to aid with the work of the x-ray and clinical laboratory departments. All the hospitals employ, on an annual basis, consultants to make pathologic examinations on tissues.

#### VALUE OF ROUTINE METHODS

So much for the administrative organization. For the maintenance of standards, as well as for convenience, the doctor has participated with the rest of the staff in the formulation of minimum diagnostic and clinical routines. These routines are a mechanism for assuring his patient the optimum services of all the departments of the hospital. To encourage still further the full use of all the services, some of the hospitals—to the full satisfaction of the administration, the doctors and the patients—have substituted fixed or flat rates for the usual system of special charges. These fixed rates entitle the patient to the use of the operating room, anesthesia, laboratory, drugs or x-rays in any amount deemed necessary by the physician. The removal of the difficulties formerly caused by a separate charge for each examination has done much to make it easier for the doctor to do his job of studying the patient thoroughly.

In addition to the regular history and physical examination, for which the attending physician and resident physician acting under his direction are responsible, the routines provide for the following initial examinations on admission: urinalysis, white blood count, hemoglobin determination and one of the precipitin tests for syphilis (which is automatically checked if positive). Proceeding from this initial survey, the doctor may order whatever additional examinations he wants and prescribe the appropriate therapy. He may call on any of his colleagues for consultation if that is necessary. As a matter of fact, through certain routines adopted by the staff, he and his colleagues have agreed to seek consultation when the life of the patient is at stake or when controversial questions of therapy are likely to arise. In addition to the initial examination, routines to cover the study of certain disease conditions such as cardionephritic, pulmonary or genito-urinary and suspected abnormalities of pregnancy have been arranged in some instances to facilitate more complete and uniform study. Routines to assure prompt care of emergencies, in the absence of the attending physician, have been found most helpful; these include such conditions as hemorrhage, shock, coma and suspected fracture of the skull.

That a plan involving the generous use of routine methods will work smoothly is illustrated by incidents which have occurred in these hospitals. A woman with a history of vaginal bleeding was brought to the hospital by her family physician. Consultation with the surgeon indicated the wisdom of a diagnostic curettage, which was done the day after admission, but only after a complete evaluation of clinical and laboratory examinations. The uterine scrapings were immediately forwarded by the hospital to the consultant pathologist, who in two days telephoned a diagnosis of adenocarcinoma. The patient was readmitted for operation on the sixth day following her original examination, when an early carcinomatous lesion of small size was revealed. Again, a physician brought a young girl to the hospital from a village ten miles away. The symptoms all pointed to an acute condition of the abdomen and the patient was scheduled for immediate operation, but not until an x-ray examination of the chest, which is routine for all children with suspected appendicitis, had been done to rule out pneumonia, a catheterized specimen had been examined to rule out pyelitis, and a third physician had been consulted because of certain vague meningeal signs. An early pneumonia was discovered and plans for operation were abandoned. The last case takes on added interest when it is learned that two of the doctors in consultation were known to have been unfriendly, to put it mildly, before the opening of the hospital. One, on being asked why he should be helping the other, replied enthusiastically "Well, you know, I have discovered since we have been working together in the hospital that that fellow isn't the fool I thought he was." These cases represent good medicine and good education and were done in a rural hospital with the smoothness and efficiency which some are led to believe can be found only in the large and highly organized institution.

The educational value of a system of routines extends in many directions. It begins with the staff committee which must study the relative value of all the possible examinations which might be included. The staff, unfortunately, is apt to accept the committee's suggestions without much discussion, and one of the most obvious reactions, though it is not openly voiced is the feeling of

a few that they are being told how to practice medicine. This attitude disappears in large measure when the obvious advantages of routines become evident. Aside from being a check on the careless and haphazard worker, which is of advantage to the patient, they open up new and sometimes unexpected fields for exploitation by the doctor who is not satisfied with guessing but wants to know.

All that the doctor has done for his patient, the results of the examinations and treatment, the opinion of the consultants and the estimate of success or failure are assembled as a completed record and filed and indexed according to diagnosis for his future reference, and possibly for presentation at a staff meeting if he has found in the study of this patient a lesson from which others might profit. This is as it should be in any hospital, so why call attention here to good record performance? Simply because it is not found in many small hospitals, as any one can attest who has looked at records, consisting of the patient's name, occasionally the address and a very neatly drawn graphic chart, and has tried to unravel the history, diagnosis and treatment from the ups and downs of the temperature and pulse rate. It may be added that what is true of records in small hospitals generally is true of many other things mentioned here.

#### STAFF MEETINGS

The staff meeting is the place for group evaluation of the progress of the professional work of the institution and for the taking of such steps as are necessary to provide an even better quality of service. Here the staff member brings his cases for criticism by his fellow staff members and here he can participate in the discussion of the cases and problems presented by others. The regular report of the hospital administration is considered in its relation to professional performance. Special committees responsible for the library, records and routine examinations bring in their reports periodically. The staffs have developed good working libraries which are kept in the meeting rooms, where they are available for immediate reference when knotty problems arise.

All that goes on in the staff meeting is a good cross section measure of the educational service of the hospital. What each member has to offer and what each member has learned are revealed. Even the frequent absence of some one to take care of the inevitable delivery, which, for mysterious reasons, always takes place on the night of the staff meeting, not in the hospital but far in the country, is suggestive. Every case presented has its story to tell—the one in which the attending physician has casually signed the resident's history and physical examination without reading the record, the one in which antipneumococcus serum was administered effectively after routine typing, and the one in which the doctor, ignoring all contraindications, operated for acute appendicitis only to be faced later with the pathologist's negative report. The staff member who was not satisfied until he got an autopsy so that he would have a complete report on a puzzling case for the next staff meeting was both a good student and a good teacher. What the pathologist has to say through his written reports and personal discussions at staff meeting has been turned to good educational advantage by persistent effort to narrow the gap between clinical and pathologic diagnoses.

No one would claim that staff performance always reaches a high level. Staff members are human beings and doctors. One phase or another of the educational

development—the library, records or consultant services—may lag, and there are marked differences between one hospital and another, probably because in certain situations group opinion or understanding has not crystallized. The point is that, generally speaking, the doctor finds a real educational stimulus and satisfaction in his association with the kind of hospital here described because it gives him the opportunity to learn from his experience.

#### FURTHER EXPERIENCE

At some place in the educational process the limits of advance are reached unless new grist is thrown into the mill. The regular staff activities, woven about local experience, have been supplemented very effectively by special programs given by guest speakers asked to present a topic of immediate concern. These discussions have been more purposeful when illustrated by local cases, and the arrangement gives the guest an opportunity to help the physician directly in interpreting the disease processes involved. In much the same manner the staff program has been aided by the use of the hospital as a center for extension teaching, and again there is no question that such a course has greater meaning when it is interpreted in terms of local experience. Very often the lecturer can consult with the staff and the hospital administration in the solution of some situation which is giving trouble. The obstetric service in one hospital was aided materially by an instructor who gave a series of ten clinics and talks, using the hospital as a meeting place.

Some physicians will leave such a hospital to go away to a medical school for formal study to satisfy further the need they increasingly feel for more information that will aid them in making full use of what they have to work with. The doctor realizes that more is expected of him now that he is working in a good hospital. He is faced with a variety of problems that he did not often meet when he was so busy riding around the country that he had time for no more than hurried examinations of his patients and an occasional urinalysis done over the office lavatory. The sacrifices entailed by a period away from practice do not seem so great now that he has the opportunity to apply, on his return, what he receives during his period of study. Fellowships have been given to those who feel this need most keenly, to provide for longer periods of study than they might otherwise have undertaken.

The doctor who goes to a medical center for study, the hospital consultants who may be from the same center, the guest speakers at staff meetings, the resident physician, and the instructors in extension courses all create an informal tie between the small outlying hospital and the larger center of education. This relationship, obviously, has mutual advantages. The small hospital has more or less constant access, in such ways, to the large center to which it must look for aid. The large center, in turn, finds a fertile field in the small hospital and community for increasing its influence in the direction of better medical education and service. Fortunately a widespread interest is now being displayed in the medical and hospital problems of the small community not only by specific teaching institutions but by many agencies with national fields of operation. The American Medical Association, the American and state hospital associations and the American College of Surgeons are doing much to improve the standards of administration of the small hospital.

## CONCLUSION

In the beginning I said I wanted to define the contribution the rural community hospital may make to postgraduate medical education. This hospital has been described as one from which the public expects good work, one where the board and the interested public are cognizant of their obligation to provide adequate facilities for the care of patients, one where the doctor must show his qualifications before receiving the privilege of working there, one where the staff maps out plans of procedure for the complete study and treatment of all patients, one where the physicians as individuals and as a group give critical study to their experience and one which assures itself of continuous help and advice from outside medical and educational centers. Such a hospital makes its contribution to education simply by being the kind of hospital it is. In it the doctor finds opportunity for professional growth by learning from what he does and by hearing about what others do. The educational value of this experience is what the doctor makes it.

## NERVE INJURIES CAUSED BY INTRAVENOUS INJECTIONS OF DEXTROSE

GEORGE B. HASSIN, M.D.

Professor of Neurology, University of Illinois College of Medicine  
Attending Neurologist, Cook County Hospital

CHICAGO

The chief possible dangers of intravenous infusion, according to Orr,<sup>1</sup> are immediate reactions with chills and fever, overburdening of the circulatory system by a rapid increase in blood volume, production of general edema and edema of the lungs, thrombosis at the site of intravenous injection with embolism, and possible increase in dehydration by the use of hypertonic solutions. To the foregoing factors must be added complications from intravenous injections of solutions of dextrose.

Six cases of injuries to the large nerve trunks (especially the median) of the upper extremities were observed by me at the outpatient neurologic clinic of the Cook County Hospital during a period of eight months, all were caused by intravenous injections of dextrose.

## REPORT OF CASES

**CASE 1**—A Negro, aged 40, who entered one of the surgical services of the Cook County Hospital Oct. 9, 1936, because of a low grade intestinal obstruction, received the first two intravenous injections of saline and dextrose solutions mixed on October 12 and 13 (the amount and the strength of the solutions were not given). They were repeated October 16 and 17, and on October 14, 15, 18 and 19 hypodermoclysis was done instead. The intravenous injections were evidently given in both arms and were somewhat difficult to administer, for a note of October 26 reads: "Attempts to draw blood for chemistry were futile to wait until ecchymoses are absorbed." On the eighth day following the first injection edema of both forearms and hands developed, and ten days later numbness was complained of in the forearm, thumb and ring finger of the left hand. At the time of the patient's discharge from the hospital (November 6) numbness and weakness were still present in the median side of the left hand.

From the neurological services of the University of Illinois College of Medicine and the Cook County Hospital.  
1. Orr, T. G. The Use and Abuse of Intravenous Therapy in Surgery. J. Missouri M. A. 34: 219 (July) 1937.

Jan. 13, 1937, when examined in the neurologic clinic, the patient related that when the needle was introduced into the left cubital fossa he experienced a peculiar sensation along the thumb, the index and middle fingers and part of the ring finger of the left hand. These fingers have felt weak and numb since. There was loss of the senses of pain, temperature and touch over their palmar surface, that of the hand to the fourth metacarpal bone and the dorsal area of the two distal phalanges of the index and middle fingers. The muscle power in the affected fingers was slightly diminished. The patient was able to oppose the thumb and move the fingers, but he could not handle the violin. May 12, five months later, the anesthetic area innervated by the median nerve felt "sore" and pin pricks elicited in them sharper pain than in the corresponding healthy side. There was also a better perception of temperature and touch, and only the dorsal surface of the distal phalanges of the index and middle fingers remained insensitive.

**CASE 2**—A white woman, aged 44, who entered the Cook County Hospital March 2, 1937, in a state of "prediabetic coma" (abdominal pain, sugar 4+, acetone 4+, diacetic acid 2+, blood sugar 187) received intravenous injections of "six bottles of 25 per cent dextrose solution in the left arm and two bottles" in the right. The patient stated that her "right arm was tied to the bed and the left arm to a board." The injections lasted thirty-six hours, and after they were discontinued the patient experienced stiffness of the entire left forearm and numbness and tingling in the thumb and the adjacent two fingers. There was shooting pain, especially at night, which radiated along the affected forearm and hand.

Examination March 31 revealed weakness in the left hand and fingers, which could be moved only slightly, loss of the senses of pain and temperature over the volar and dorsal surfaces of the two distal phalanges of the index and middle fingers and the volar surface of the terminal phalanx of the thumb, while the sense of temperature was abolished over the volar surface of the entire index and middle fingers and the corresponding volar metacarpal areas of the hand. The sense of touch was abolished in the same areas but was present in the basal phalanges. The lesion thus was, as in the previous case confined to the median nerve and involved mainly its sensory fibers.

Even more striking and typical were the disturbances of the median nerve in case 3.

**CASE 3**—A white woman, aged 45, diabetic, who had been operated on Feb. 23, 1937, for cholecystitis, received on the day of the operation an injection of a 10 per cent solution of dextrose (amount not given) and 20 units of insulin. The patient stated that right after the insertion of the needle she experienced numbness in the left hand.

Examination September 29 (seven months later) revealed slight weakness and anesthesia in the left thumb, forefinger and middle finger and the corresponding palmar surface of the hand. November 10 sensibility was found still markedly impaired but the motor power was good. However the patient was unable to do finer work such as knitting or sewing.

In some cases the median nerve was involved together with the musculospiral and ulnar nerves.

**CASE 4**—A white woman aged 44 who had been operated on March 24, 1937, for cholecystitis received in the right arm several injections of 1000 cc. of 5 per cent solution of dextrose with 0.4 per cent saline solution. After the first injection March 25, 1937 swelling of the entire right arm developed which was followed by a wrist drop.

Examinations May 12, June 9 and July 7 revealed weakness in the right hand which was drooping inwardly rotated and could not be moved sideways. The thumb was bent into the palm and there was severe pain in the paralyzed hand which extended to the shoulder. Sensibility (pain and touch) was only slightly impaired over both the palmar and the dorsal surfaces of the hand in the areas of distribution of the radial and somewhat of the median and ulnar nerves. The temperature (heat and cold) was perceived normally, whereas the median and ulnar nerves responded normally to the electric currents the radial nerve exhibited a reaction of degeneration.

CASE 5—A man, aged 24, had undergone an emergency operation at the Cook County Hospital April 20 1937, for a perforated peptic ulcer. On the day of the operation he received an intravenous injection of a 2.5 per cent solution of dextrose first in the left and two days later in the right arm. After the injection the patient noticed swelling of the right arm and forearm and a yellowish brown discoloration about the elbow.

Examinations May 21 and July 28 revealed flexor weakness of the right thumb and the index and middle fingers, supination of the right forearm and adduction of the right thumb were impaired. The sensibility, except for the sense of touch, was not affected, but the power was diminished in all the small flexors of the hand and abolished in the terminal phalanges of the right index and middle fingers. The patient experienced numbness and difficulty in handling objects. In short, the patient presented a combined lesion of the median, ulnar and musculospiral nerves.

CASE 6—A boy, aged 14 years, entered the Contagious Disease Department of the Cook County Hospital Sept. 20 1937, three weeks after he had taken sick with scarlet fever.

An emergency operation for appendicitis was performed September 23 and on the same day an injection of a 2.5 per cent solution of dextrose in 0.4 per cent saline solution was administered and repeated October 1 and 2. After the first injection wrist drop developed, which improved within the next six days, according to a note of September 29.

Examination revealed a wrist drop with ulnar deviation of the hand, ankylosis of the elbow joint, atrophy of the muscles of the right forearm, and inability to extend the wrist and fingers abduct the thumb and supinate the forearm, the flexors of the fingers were weak, but the opposition of the thumb was normal. Sensibility was normal throughout.

Patient 7 was observed by Dr. Bassoe<sup>2</sup> in his private practice.

CASE 7—A man, aged 71, was operated on for appendicitis Aug. 20, 1937. Toward the end of the operation he was given an intravenous injection at the right elbow of 5 per cent dextrose and Ringer's solution. On awakening he complained of pain in the arm. There was much swelling of the forearm and hand. Hot dressings aggravated the condition. When examined by Dr. Bassoe November 6 the swelling of the forearm had subsided but the circumference of the right hand was 2 cm greater than that of the left. There was no actual paralysis, but flexion of the terminal phalanges of the index and middle fingers and opposition of the thumb to the little finger were still slightly impaired. The movements controlled by the ulnar nerve were much better. Sensation was normal. Movements at the shoulder and elbow were perfectly normal. A roentgenogram of the neck showed an old fusion of the sixth and seventh cervical vertebrae with a bony bridge anteriorly. This very old lesion could not account for the symptoms, which appeared immediately after the injection at the elbow.

Of interest is a patient of Dr. C. P. Midgley.

CASE 8—A man, aged 54, a sufferer from tabetic gastric crises, had been given intravenous injections of solutions of dextrose at St. Luke's Hospital about three years before. In the course of injections numbness developed in the left hand which has slightly persisted since. At the last examination almost three years after the injections, there was still present paresthesia along the distribution of the median nerve, the muscle power was excellently preserved in the affected hand and no atrophies were in evidence.

#### COMMENTS AND CONCLUSIONS

The instructive features in the cases recorded were predominant involvement of the median nerve, which was regularly affected in all the cases except case 6, the prevalent lesion of the sensory nerve fibers (the motor disturbances prevailed only in case 6), the long duration of the anesthesia, and the obscure mechanism of the origin of such nerve lesions. That they are due to the injections there can be no doubt, but it is doubt-

ful whether they are caused by a possible nicking of the nerve by the needle, though this nerve is situated nearer to the cubital veins than the other nerves. The presence of ecchymoses (cases 1 and 5) around the elbow would speak for such an etiology, though pressure by the adhesive plaster in holding the needle in place on the arm or the arm's fixation against the board combined with the long duration of the injections in patients debilitated and weakened by protracted illness (diabetes) or dangerous surgical states may also be responsible for the neuritic phenomena. The edema or swelling that was present in some cases can hardly be considered a contributing factor, as in other cases swelling was not mentioned. Probably several factors were instrumental in the causation of the nerve lesions mentioned and should be borne in mind at the time the injections are given. It is a wonder that accidents to the large nerves are not more frequent in view of the great frequency with which injections of intravenous solutions are administered.

Cook County Hospital

## MEDICAL REQUIREMENTS OF THE HOSPITAL PHARMACY

WENDELL J. STAINSBY, M.D.

NEW YORK

Before the medical requirements of a hospital pharmacy are considered, it is important to have a clear understanding of the function of hospitals. It is generally recognized that a hospital has four primary purposes:

- 1 The diagnosis of disease
- 2 The treatment of the patient
- 3 The teaching of doctors, nurses and medical students
- 4 Research

#### DIAGNOSIS OF DISEASE

As regards the diagnosis of disease, the clinician and the diagnostic laboratories are alone concerned, but as regards the other three functions of the hospital the pharmacy often has an important role. It is my plan to discuss the relationship of the pharmacy to these three important purposes of the hospital.

#### TREATMENT OF THE PATIENT

As regards the first of these, namely, the treatment of the patient, the role of the pharmacy is distinctly important. Therapeutic results depend in large measure on the pharmacy's dispensing exactly what is ordered. The physician is concerned principally with the question of purity and potency of the drug or biologic preparation he is administering. Many pharmacists assume that the information concerning purity and potency as provided by the manufacturer is correct. Experience has shown that such information cannot always be relied on either because of lack of care in the manufacturing process or from deterioration following the manufacture of the preparation. The hospital pharmacist should therefore, in the interest of patients, have the necessary training to test the purity and potency of the various drugs he dispenses. If he is able to make these tests he may at the same time save his institution a considerable amount of money, as he will be able to purchase his drugs from smaller less

From the New York Hospital and Department of Medicine, Cornell University Medical College.  
Read before the Hospital Subsection of the eighty-fifth annual meeting of the American Pharmaceutical Association, New York, Aug. 20, 1937.

<sup>2</sup> Bassoe, Peter. Personal communication to the author.

well advertised firms often at an appreciable reduction in price. As soon as pharmaceutical firms realize that a hospital pharmacy makes it a practice of testing preparations, they will be careful not to send inferior products to it. Furthermore, it is not necessary to test all samples of any drug procured by the pharmacy, an occasional check-up being sufficient for practical purposes.

In order that the well trained and experienced pharmacist may carry out the necessary tests for strength and purity of drugs, it is important that the hospital pharmacy have a laboratory equipped for the purpose. Such a laboratory need not be elaborate nor have much expensive equipment. The small original cost for establishing it will be more than compensated for by the savings that will result. There is usually little difficulty in obtaining such a laboratory if the pharmacist can demonstrate that he is capable of using it to the advantage of the hospital.

#### TEACHING OF DOCTORS, NURSES AND MEDICAL STUDENTS

As regards the second of the primary functions of the hospital that affects the pharmacy, namely, the teaching of doctors, nurses and medical students, the pharmacy likewise plays an important role. This is particularly true when the institution is connected with a medical college but is of importance even when it isn't so connected. When the medical student receives his instruction in pharmacy, pharmacology and the principles of therapeutics during his preclinical training, he is given a scientific and critical presentation of these subjects. All too often, therapeutic ideals thus instilled are later shattered by the irrational therapeutic measures prescribed by a certain number of the physicians on the hospital staff. In this regard it must be realized that in some of the larger hospitals several hundred doctors are members of the staff. In such large groups a considerable number of physicians will always be found who lack a critical attitude toward the conglomeration of proprietary medications that are being continually thrust on them by samples, circular letters and other forms of advertising. The various pathologic processes that afflict mankind together with their treatment constitute an enormous field for any one man to master. To retain this mastery and to appreciate and utilize new additions to our medical knowledge make it necessary for the physician to spend a considerable amount of time and effort in reading and studying. Not all physicians have the necessary time or interest to keep up with this work. As a result of this they are often confused as to what new drugs have been established as having new and definite therapeutic action. Often they are misled by glowing accounts of proprietary medications. In order, therefore, to protect the reputation and finances of the hospitals, it has been necessary in many instances to place restrictions on the use of proprietary medications in these hospitals. These restrictions are usually carried out through a committee conveniently called the "formulary committee," which is composed of representatives of the various clinical departments, the pharmacy, and the department of pharmacology if the hospital is connected with a medical college. The medical representatives are selected because they have developed a critical attitude toward therapeutic procedures. Such formulary committees have supervisory powers as regards what drugs shall or shall not be issued from the pharmacy, subject to approval by the hospital administration.

#### FORMULARY COMMITTEES

In the New York Hospital the Formulary Committee functions under the following rules, which have been approved by the governing bodies of the institution:

I Simple official (Pharmacopeial) substances and any Useful Drugs will be admitted (when requested) unless they have become superfluous.

II No article will be admitted (except for controlled research) before its therapeutic value has been established.

III No article of secret composition will be admitted.

IV No article which is sold under a proprietary name will be admitted under such a name if a substance of identical composition can be obtained under a nonproprietary name.

V No mixture of two or more active substances will be admitted unless evidence is submitted that the mixture represents therapeutic advantages over the simple substances.

VI No proprietary article will be accepted before it has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies.

VII It is the policy of the committee to discourage the intravenous and intramuscular injections of substances which should be administered orally.

VIII The pharmacist is instructed to supply in emergencies preparations not yet accepted by the Formulary Committee.

IX The Pharmacist will stock or supply drugs requested on the private or semiprivate services even though they have not been accepted by the Formulary Committee.

X Heads of clinical departments are to be notified whenever any preparation is considered for elimination from the Formulary in order that they may submit their evidence for its retention.

XI Drugs not accepted by the Formulary Committee may be supplied to the public pavilions if paid for by the department concerned.

XII The chief pharmacist is instructed to issue drugs under rules governing the Formulary Committee subject to the approval of the Medical Board.

XIII The Formulary Committee shall prepare and issue new editions of the Formulary whenever the Medical Board considers it necessary.

XIV All actions of the Formulary Committee are subject to the approval of the Medical Board.

The hospital pharmacist is always an active and important member of these formulary committees. In order for him to function effectively on these committees, it is important that he be familiar with the medical literature relating to drug therapeutics, that he have a working knowledge of pharmacology in addition to an extensive knowledge of pharmacy, that he have a critical attitude toward proprietary medications and that he be familiar with the actions of the Council on Pharmacy and Chemistry of the American Medical Association with regard to this type of medication.

As the hospital pharmacist has an important role on hospital formulary committees, it might be well to discuss briefly the problems that confront such committees and the procedures for solving them.

The chief problems of the formulary committee are:

- 1 Proprietary medications
- 2 Unnecessarily complicated prescriptions

In the first place, proprietary medications may be classified into one of three groups:

- 1 Drugs the therapeutic value of which has never been established
- 2 Drugs that are not essentially different in therapeutic action from simple official (U S P) preparations
- 3 Drugs that have a new and definite therapeutic value but have not as yet been in use a sufficient length of time to receive official sanction

The first step in the deliberation of the formulary committee is to classify a request proprietary drug under one of these three categories. If it should fall under groups 1 or 2, that is, its therapeutic value has not been established or its action does not differ essentially from simple cheaper official preparations, it is the duty of the formulary committee in the interests of economy and rational therapeutics to prevent the use of such a preparation in the hospital except for the purpose of controlled research.

As regards the third group of proprietary drugs, namely, those which have a new and definite therapeutic use, it is the duty of the committee to see that they are made available as soon as possible for clinical use. In order that mistakes be not made with regard to this group of proprietary drugs, careful analyzing of scientific articles concerning the drug is necessary.

The second important duty of the formulary committee is in regard to complex formulas. During recent years there has been a marked tendency toward simplification of formerly used formulas containing numerous active drugs. Nevertheless there are still physicians who, lacking essential knowledge of pharmacology, present unnecessarily complex prescriptions. Again in the interests of rational therapy, the formulary committee must eliminate such type of medication if the hospital is to maintain its reputation. The hospital pharmacy has an additional incentive to eliminate such forms of therapy as the work involved in preparing complex mixtures means an unnecessarily large pharmacy staff with resulting increase in expense to the hospital. With few exceptions, therefore, hospital formulas should contain only one active drug besides flavoring, solvents or necessary vehicles for the administration of the active therapeutic agent.

#### RESEARCH

The third function of the hospital that involves the pharmacy concerns itself with research problems involving the use of drugs either in animal experimentation or in clinical investigation. This problem resolves itself into two parts:

- 1 Investigation by the pharmacist
- 2 Assistance to physicians engaged in research work.

As regards investigation by the pharmacist himself, I feel that the pharmacist to be successful should from time to time critically examine the various preparations he issues to the hospital for the purpose of determining whether they can be simplified or improved, or whether or not he can manufacture them cheaper or better than can be obtained commercially.

As regards assistance to physicians engaged in research problems, the pharmacist can be of considerable help. He should have the knowledge and interest to assist in the preparation of new drugs and in new and untried methods of administering those of already established therapeutic value. Too often the physician has to enlist the services of commercial pharmacists for this purpose at considerable expense and with often less satisfactory cooperation.

A word should be said here concerning what constitutes a research problem. Too many people consider that merely trying this and that in a haphazard way constitutes research. As far as establishing the therapeutic value of drugs is concerned, research is the carrying out of a study under controlled conditions and under a definite plan with a sufficient number of cases in order that definite information can be obtained as to the therapeutic value of the product.

#### FUTURE OF HOSPITAL PHARMACIES

A word should be said concerning my impression of the future of hospital pharmacies. Will the continued development and improvement of large pharmaceutical firms render it unnecessary or uneconomical for the hospital pharmacy to manufacture or compound medicinal preparations, so that in time the pharmacy will become little more than a storeroom and the pharmacists mere clerks? In my opinion, this will never happen. There are too many preparations that deteriorate on standing, there are too many preparations, such as solutions, that because of their bulk make it uneconomical for transportation from the factory to the pharmacy except in concentrated form, and finally, and most important, the educational demands of a high class hospital make it essential for such institutions to maintain an efficient pharmacy and competent hospital pharmacists.

### *Clinical Notes, Suggestions and New Instruments*

#### DERMATITIS DUE TO HEMORRHOIDAL OINTMENT CONTAINING KRAMERIA AND OIL OF CADE

MAX GROLNICK, M.D. BROOKLYN

This case is reported to call attention to a medicament which has not been previously reported as capable of producing a contact dermatitis when applied to the skin.

A man, aged 23, a college student, complained of itching and pain in the perianal region and marked moisture in this area, Nov 14, 1933. Local examination revealed an extensive swelling of the skin in the intergluteal, perineal and scrotal areas, with superimposed vesicles and bullae of varying size. The remainder of the physical examination was essentially negative.

The history revealed that the patient had been applying a patented remedy, "Dorb's Pile Ointment," for a period of one week for the relief of a prolapsed hemorrhoid. Two days after the ointment was discontinued the area between the buttocks began to itch and become moist.

A diagnosis of contact dermatitis was made. With rest and local applications of wet dressings the entire condition subsided in two weeks.

A patch test with a sample of the ointment was applied. In twenty-four hours an erythema with slight infiltration had developed. At the forty-eight hour reading a third degree reaction (Bloch) was present. In addition there was a third degree reaction caused by the adhesive plaster. The patient gave no previous history of skin irritation by adhesive plaster.

According to information printed on the trade package, the pile ointment contained sulfur, zinc oxide, resorcin, galls, stramonium, krameria or rhatany, and oil of cade. The percentage of each was not given. The patient was therefore tested with each of these ingredients separately. In addition tests were made with a number of common contact excitants, such as mercury, hydrous wool fat, ichthammol, poison ivy, paraphenylenediamine, butesin picrate, quinine, chromium, pyrethrum, nickel and the substances which comprise adhesive plaster mass. Instead of employing the regular patch test technic, which utilizes adhesive plaster, a substitute procedure was used. The substance to be tested was covered by a disk made of single faced rubberized cloth, which was sealed to the skin with a rim of "Duo Adhesive."<sup>1</sup>

Positive reactions were obtained to fluid extract of krameria (U.S.P.) (fourth degree), 1 per cent oil of cade (second degree), 5 per cent oil of cade (fourth degree), poison ivy (third degree), native rubber (third degree), and rosin (second-

<sup>1</sup> Grolnick, Max. Studies in Contact Dermatitis. I. Technic for Surface Testing on Patients Sensitive to Adhesive Plaster. *J. Allergy* 7: 3-11 (May) 1936.



third degree) The latter two substances are the agents responsible for adhesive plaster dermatitis of the specific type<sup>2</sup>

When the patient was informed of these reactions he recalled that on two occasions in 1930 ointments prescribed by a physician for an axillary ringworm had to be discontinued because they had produced local swelling and blistering

The patient reappeared Nov. 20, 1935, with a vesicular dermatitis in both axillae. One week previously he had begun to apply "Yodora," a deodorant, to the axillary regions. He discontinued its use after three days. On the fifth day there were itching and redness in both axillae. Examination revealed a definite dermatitis with numerous small vesicles. The subject did not return at that time for any tests.

Two years later (Nov. 5, 1937) the patient submitted to a number of tests, which included rosin, rubber, "Yodora," 1 per cent oil of cade, "Dorb's Pile Ointment," adhesive plaster and fluid extract of krameria. Both the hemorrhoidal ointment and krameria produced a third degree reaction. The adhesive plaster revealed only a faint erythema. The reactions to the other tests were negative.

#### SUMMARY

A subject was found sensitive to krameria, to oil of cade and to the rosin and rubber contained in adhesive plaster. He was presumably sensitive to some ingredients of a skin deodorant and of several ointments that had been prescribed by physicians. A repetition of tests after an interval of four years showed a persistence of the sensitivity to krameria but to none of the other substances. A long series of experiments, which I performed,<sup>3</sup> has revealed the value of krameria as a sensitizing substance for experimental purposes.

2821 Avenue K

#### AN UNUSUAL CAUSE FOR EOSINOPHILIC LEUKOCYTOSIS

WILLIAM GERRY MORGAN, M.D. AND WILLIAM M. BALLINGER, M.D. WASHINGTON, D. C.

Mrs. G. L. N., a housewife, aged 61, complained chiefly of a rather constant pain in the midepigastrium which she had had for the past month. Now and again for some two or three years she had complained of mild nausea, which, however, was of only temporary nature. Shortly after the development of the epigastric pain in July or the first part of August 1937 she had begun to experience pain in the back, which was not constant as to either time or location. She had noted a certain amount of loss of strength and endurance and had also lost some 10 pounds (4.5 Kg.) in the preceding twelve months. The symptomatology was otherwise essentially negative. The bowel movements were normal. There was slight dyspnea on exertion but no precordial pain and no edema. There was no cough or other symptom suggestive of respiratory disease and no difficulty in urination, but there was nocturia of two or three voidings without pain or any especial urgency. There was nothing except her general loss of strength suggestive of any pathologic condition of the central nervous system.

The past history was essentially negative. She had always been robust and had had no serious illnesses. The menstrual history had been normal with the onset of the menopause at the age of 45. Aside from a tonsillectomy at 45 and a curettage at 43 she had had no operations. She did give a history of a severe attack of cystitis (with probable pyelitis) four years before, but with complete recovery and no recurrences.

The family history was of asthma in one member of the family and cardiovascular renal disease in her mother, who died at the age of 65. Her father died at the age of 83.

The patient was well developed, weighing 150 pounds (68 Kg.) with a height of 5 feet 8 inches (172.7 cm.). The temperature was 98.6 F., the patient was not acutely ill. No evidence of abnormality was to be made out on a routine complete examina-

tion. The cardiovascular system was normal, the lungs were clear, tenderness, masses, scars and herniations were absent in the abdomen. The liver, spleen and kidneys could not be palpated. The nose and throat were normal. The thyroid area was normal. No enlarged lymphatics could be made out. The reflexes, motion, sensation and coordination were normal.

Laboratory examinations were notably negative. There was a very moderate degree of hypochromic or secondary anemia, the hemoglobin was 75 per cent (Dare), red blood cells numbered 4,650,000 and white blood cells 7,000, with a normal differential count of 64 per cent polymorphonuclear leukocytes, 35 per cent lymphocytes and 1 per cent eosinophils. Coagulation time was three and one-fourth minutes. The blood pressure was 123 systolic, 80 diastolic. The Wassermann reaction of the blood was negative. An electrocardiogram had been made six weeks before and had been reported normal. Analysis of the gastric contents and urine and stool studies were negative and the basal metabolic rate was normal. Rectal examination showed old hemorrhoids, otherwise it was negative. Pelvic examination had recently been made elsewhere and was reported negative. An x-ray study of the chest showed moderate widening of the aortic arch but was otherwise negative. Gastro-intestinal x-ray study showed a moderately ptosed stomach, a dilated cecum with cecal stasis and a spastic colon with sigmoidal diverticula. Gallbladder study by the Graham (intravenous) technique showed poor filling and slow evacuation, evidence of a poorly functioning gallbladder without definite evidence of stone or other disease.

Details as to the progress of this case will be omitted, for we are here interested primarily in but three things: (1) the rapidly downhill course of the patient in general, (2) the progressive change in the blood picture and (3) the final diagnosis. Repeated counts showed no essential change in the hemoglobin and red blood cell values. The white blood cell count when first made, August 17, was 7,000. August 30 it was 7,200, with a normal differential count. September 10 the count rose to 21,500 with 70 per cent polymorphonuclear leukocytes, 23 per cent lymphocytes, 1 per cent eosinophils, 1 per cent basophils and 5 per cent endothelial cells. September 15, five days later, the white cell count was 29,200, 82 per cent polymorphonuclear leukocytes, 9 per cent lymphocytes, 1 per cent basophils, 1 per cent large monocytes and 7 per cent eosinophils. September 17 the white cell count was 28,800, with 80 per cent polymorphonuclears and an eosinophil count of 13 per cent. On the following day the leukocyte count had risen to 33,800, polymorphonuclears 66.5 per cent and the eosinophil count 18 per cent. September 18 a laparotomy was done, the observations on which are given later. September 24 the last count was made: 86 per cent hemoglobin, 4,630,000 red blood cells, 40,400 white blood cells, 75 per cent polymorphonuclears, 17 per cent eosinophils. The patient died October 5. Permission for a postmortem examination was denied.

Laparotomy was performed September 18 and the conditions found were noted on the operative chart as follows: "On opening the abdomen the liver was immediately encountered and was found to be enlarged and nearly entirely filled with metastatic nodules. A few soft spots were to be felt, which while not feeling like normal liver tissue could possibly have been broken down metastatic nodules. No primary source of the carcinoma outside the liver could be found."

Biopsy of the tissue removed at operation was done by Dr. V. J. Dardinski, pathologist, Georgetown University Hospital with a diagnosis of adenocarcinoma grade 4. The source of the primary tumor could not be determined by examination of this tissue.

This case is reported primarily because of the unusual eosinophilic response in the blood picture to the presence of a rapidly progressive grade 4 intra-abdominal malignant growth and because it shows what is only too well known, the great difficulty in accurate diagnosis in this type of malignant disease.

The hypothesis is advanced that the marked leukocytosis was the result of liver metastasis with a breaking down or necrosis of liver substance and that the marked eosinophilia is most likely an allergic phenomenon resulting from this rapid protein breakdown with absorption.

1801 Eye Street N.W.

<sup>2</sup> Schwartz, Louis and Peck, S. M. The Irritants in Adhesive Plaster. *Pub. Health Rep.* 50:811 (June 14) 1935. Grolnick, Max. Studies in Contact Dermatitis. II. Clinical and Immunologic Observations on Patients Sensitive to Adhesive Plaster. *J. Allergy* 7:556 (Sept.) 1936.

<sup>3</sup> Grolnick, Max. Studies in Contact Dermatitis. III. Active Sensitization of Humans with Krameria to be published. Read before the Hippocratic-Galen Society, Washington, D. C. Dec. 2, 1937.

## THERMOMETER AS FOREIGN BODY IN ESOPHAGUS

VIRGIL J. SCHWARTZ, M.D., MINNEAPOLIS

When it is recalled how common the practice is of leaving thermometers in the mouths of patients, including children and mental patients, it is indeed remarkable that these do not more frequently find their way into the esophagus or bronchi.

M. A., a man aged 45, had bulbar paralysis. Like others with this affliction, he had great difficulty in swallowing voluntarily, although at times, owing to paralysis of the tongue and of the pharyngeal muscles, these patients are apt to inhale food and other particles into the larynx. In somewhat the same manner it can be understood how substances might slip from the pharynx into the esophagus. The nurse had left a thermometer in his mouth, and when she returned to check the temperature she found that it had disappeared. The patient was not of sound mentality and had a speech defect besides, but it appeared that he might have swallowed it. A roentgenogram taken after several hours had elapsed showed the thermometer incarcerated at an angle just above the cardiac end of the esophagus. Esophagoscopy was immediately done and the thermometer removed intact, the patient being none the worse for his experience. The fact that it could slip from the pharynx into the esophagus without breaking was due, as stated to the paralysis of the lingual and pharyngeal muscles.

So far as can be determined from a perusal of the literature this is the first case of its kind on record. It is possible however that a case or two might have been missed, but in any event the condition is extremely rare.

78 South Ninth Street

CISTERNAL PUNCTURE WITH SPECIAL REFERENCE  
TO THE AGEDMAGNUS C. PETERSEN, M.D., WILLMAR, MINN.  
Superintendent, Willmar State Hospital

The almost complete absence of unpleasant sequelae induced me in 1927 to adopt cisternal puncture as a routine measure. Previously I had used it only in selected cases. Since then lumbar puncture has not been resorted to except when fluid was not readily obtained by the suboccipital route.

Of the 4,300 cisternal punctures performed, 747 were in persons past the age of 60, the oldest being 104. As the conception of age is relative, this group is tabulated herewith.

*Age Distribution in Group Past 60 Years*

Age	Number
60-64	205
65-69	167
70-74	166
75-79	115
80-84	63
85-89	25
90-94	4
95-99	1
100 and over	1

Most of the punctures were done on mental patients in state hospitals. The greater number were in connection with the initial neuropsychiatric examination. Some, however, were made following treatment and for various therapeutic reasons.

Although I prefer Ayer's technique, it was not used in all cases. When the neck could not be flexed sufficiently to place the tissues under tension, the Eskuchen method often was found more suitable. At times it was convenient to modify both.

The depth to which the needle must be inserted depends on the thickness of the neck and the angle of insertion. In this series it varied from less than 2 up to 7 cm. It is evident, therefore, that the sense of touch is a safer guide than any mechanical device.

No untoward after-effects were noted. Only one patient complained of intense headache. This was of the meningeal

type and recurred following a subsequent lumbar puncture. A slight stiffness of the neck, lasting for a few hours, was not an infrequent occurrence. This was never severe enough to prevent the person from being up and about, attending to his usual duties. It is noteworthy that patients have less fear of the cisternal than of the lumbar puncture.

Age has been considered a contraindication to cisternal puncture. Since the blood vessels tend to be more tortuous in the aged it was assumed that the danger of causing hemorrhage into the cisterna would be greater. Experience however does not confirm this fear. There was no more bleeding to the surface in the older than in the younger subjects, nor was there any clinical evidence of blood entering the subarachnoid space.

## SUMMARY

1. Of 4,300 cisternal punctures made, 747 were in subjects ranging in age from 60 to 104 years.
2. No untoward after-effects were noted.
3. Patients prefer the cisternal to the lumbar puncture.
4. Age is not a contraindication to cisternal puncture.

*Special Article*THE THERAPEUTIC USE OF VITAMIN  
B<sub>1</sub> IN POLYNEURITIS AND CAR-  
DIOVASCULAR CONDITIONS

## CLINICAL INDICATIONS

MAURICE B. STRAUSS, M.D.

BOSTON

*This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—Ed.*

Vitamin B<sub>1</sub> deficiency in man involves predominantly the nervous and circulatory systems. Clinical descriptions of the disturbances in these systems under the name beriberi date back to ancient Chinese medical writings. Although known to be widespread in the Orient and common in Newfoundland, beriberi has been considered rare in the United States of America<sup>1</sup> except for its occasional occurrence in epidemic form in penal institutions and insane asylums. During the past decade, however, it has been shown that beriberi is and has been endemic in the United States in characteristic form.<sup>2</sup> Alcoholic polyneuritis, the toxic polyneuritis of pregnancy, diabetic, biliary and gastrogenous polyneuritides, postinfectious polyneuritis, the Korsakoff syndrome and other similarly misleading names

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard) Boston City Hospital and the Department of Medicine, Harvard Medical School.

1. Cowgill, G. R. Vitamin B<sub>1</sub> in Relation to the Clinic. *J. A. M. A.* 98: 2282 (June 25) 1932.
2. (a) Shattuck, G. C. Relation of Beriberi to Polyneuritis from Other Causes. *Am. J. Trop. Med.* 8: 539 (Nov.) 1928. (b) Strauss, M. B. and McDonald, W. J. Polyneuritis of Pregnancy: a Dietary Deficiency Disorder. *J. A. M. A.* 100: 1320 (April 29) 1933. (c) Wechsler, I. S. Etiology of Polyneuritis. *Arch. Neurol. & Psychiat.* 29: 813 (April) 1933. (d) Minot, G. R., Strauss, M. B. and Cobb, Stanley. Alcoholic Polyneuritis: Dietary Deficiency as a Factor in Its Production. *New England J. Med.* 208: 1244 (June 15) 1933. (e) Urmey, T. V., Ragle, B. H., Allen, A. W. and Jones, C. M. Beriberi Secondary to Short Circuited Small Intestine. *New England J. Med.* 210: 251 (Feb. 1) 1934. (f) Strauss, M. B. The Role of the Gastrointestinal Tract in Conditioning Deficiency Diseases. *J. A. M. A.* 103: 1 (July 7) 1934. (g) Strauss, M. B. The Etiology of Alcoholic Polyneuritis. *Am. J. M. Sc.* 189: 378 (March) 1935. (h) Jolliffe, Norman, Colbert, C. N. and Joffe, P. M. Observations of the Etiologic Relation of Vitamin B (B<sub>1</sub>) to Polyneuritis in the Alcohol Addict. *ibid.* 191: 515 (April) 1936.

have concealed the true diagnosis of vitamin B<sub>1</sub> deficiency in the Western World. Clinically and pathologically identical to the Oriental disease, these polyneuritides differ only in the particular mechanism by which the deficiency is brought about. Cowgill<sup>3</sup> has shown that the vitamin B<sub>1</sub> requirement of man is directly proportional to body weight, caloric intake and metabolism. Beriberi develops in the Chinese coolie primarily because his customary diet, consisting largely of polished rice, contains an insufficient amount of vitamin B<sub>1</sub> per calory. Infections or excessive physical exertion, raising the total metabolism, not infrequently precipitate the acute symptoms of deficiency.<sup>4</sup>

Beriberi develops in the westerner because complicating factors render his vitamin B<sub>1</sub> intake inadequate. The person addicted to chronic alcoholism usually ingests a sufficient amount of vitamin B<sub>1</sub> for his caloric intake in the form of food<sup>2b</sup> but each calory received in the form of alcohol decreases the total intake of vitamin B<sub>1</sub> and increases the requirements. Furthermore, gastro-intestinal disturbances,<sup>2a</sup> not uncommon among steady drinkers, may so interfere with absorption<sup>5</sup> that the amount of vitamin B<sub>1</sub> absorbed is considerably reduced. Thus the chronic excessive imbibor is prone to develop B<sub>1</sub> deficiency. The pregnant woman, when nauseated, often restricts her diet to concentrated carbohydrate foods, low in vitamin B<sub>1</sub> content. Then, because of vomiting, she fails to retain all that she does ingest<sup>2b</sup>. Further, her metabolism, and with it her vitamin B<sub>1</sub> requirement, is elevated by gestation, and it is possible that her powers of assimilation are reduced.<sup>6</sup>

The patient with pyloric stenosis is prone to partake of a diet low in vitamin B<sub>1</sub> and usually loses part of this small amount through vomiting.<sup>7</sup> In colitis of various types, improper dietary regimens may lead to a limited intake of vitamin B<sub>1</sub> and there may well be little retained because of diarrhea and alteration of intestinal absorption.<sup>8</sup> Prolonged febrile illnesses are frequently associated with anorexia. Diets are limited. Fever raises the metabolic rate and with it the vitamin B<sub>1</sub> requirement. Further, fever may well interfere with the assimilation and utilization of vitamin B<sub>1</sub> as well as other substances derived from food. Cirrhosis and other diseases of the liver, arteriosclerosis and other conditions involving severe damage to vital organs may all raise the vitamin B<sub>1</sub> requirement by acting to inhibit the utilization of this substance. It is in such fashions that beriberi develops most commonly in the United States.

Of course, not all polyneuritides and circulatory disturbances of unknown etiology are due to vitamin B<sub>1</sub> deficiency. It is quite possible also that some of the supposed symptoms of B<sub>1</sub> deficiency in man are in reality due to some other factor closely associated with vitamin B<sub>1</sub> in nature, such as riboflavin, nicotinic acid, and other compounds. Vitamin B<sub>1</sub> was isolated only recently, and it is as yet too early to have tested the effect of pure vitamin B<sub>1</sub> on all of the conditions generally ascribed to vitamin B<sub>1</sub> deficiency and which are amenable to therapy with crude B<sub>1</sub> preparations. As to the clinical differentiation of the different types of polyneuritides, this may be aided materially by the history of dietary deficiencies or conditioning factors, such as alcoholism, pregnancy, diabetes and gastro-intestinal disorders. Frequently, however, the differentiation can be made from the clinical examination of the patient.

#### NEURAL MANIFESTATIONS OF VITAMIN B<sub>1</sub> DEFICIENCY

The onset of vitamin B<sub>1</sub> deficiency may be sudden, but it is generally insidious. Heaviness of the legs and tenderness of the calf muscles when they are squeezed are usually the earliest manifestations. Walking short distances is unimpaired, but when longer walks are attempted weakness may become apparent. Frequently patients will note that they will commence walking with no disability whatever but that after having traversed a variable distance their legs will suddenly collapse under them. At first a distance of a mile or more may be required to bring out this weakness. Later a hundred feet may be sufficient. After some minutes of rest, walking can be resumed. Burning of the soles of the feet and numbness of the dorsum and lower part of the ankle are next to appear. Weakness of dorsiflexion of the toes then becomes objectively demonstrable. The achilles and patellar reflexes become diminished, then absent. Weakness gradually spreads upward, involving the extensors of the foot, then the muscles of the calf and, finally, the extensors and flexors of the leg. By the time the thigh muscles become weak, toe and foot drop is usually manifest. With the motor phenomena there is *pari passu* an ascent of sensory signs. Hypesthesia advances up the leg and thigh in a bandlike wave, with anesthesia following in its wake. Atrophy of muscles and skin sets in shortly, the skin becoming smooth and shiny. Not until the disorder has progressed to a moderate degree in the legs do symptoms referable to the upper extremity ordinarily appear. However, the hands and arms may be affected first, especially in individuals who use their hands a great deal more than their legs. As in the feet, the symptoms commence with burning, numbness and weakness of the hands, followed by wrist drop, hypesthesia and anesthesia, together with a loss of tendon reflexes. In an advanced case the patient becomes bedridden, suffers great pain even from the pressure of the bedding, and is prone to develop decubitus ulcers. Sphincter control is usually maintained until very late stages. Cranial nerves other than the tenth are rarely involved, but memory defects are common. The patients with mental symptoms are generally cheerful and happy in spite of the extent of the disability and discomfort, although marked mental depression may occur.

The rapidity with which the polyneuritis of beriberi advances varies markedly in individual cases. There is evidence that in the total absence of the antineuritic

3 Cowgill G R. The Vitamin B Requirement of Man. New Haven Conn. Yale University Press 1934.

4 Keefer C S. The Beriberi Heart. Arch Int Med 43: 1 (Jan) 1930.

5 Groen J. The Absorption of Glucose from the Small Intestine in Deficiency Disease. New England J Med 215: 247 (Feb 10) 1938.

6 Strauss M B and Castle W B. Studies of Anemia in Pregnancy. I. Gastric Secretion in Pregnancy and the Puerperium. Am J M Sc 154: 655 (Nov) 1932.

7 Duvernav. Nevrites peripheriques toxiques liees a de la retention gastrique. Lyon med 109: 53 (July 14) 1907. Couremenos and Conos. Polyneurite dans l'ulcere gastrique. Encephale 7: 423 (Nov 10) 1909. Klippel M and Weil M P. Les complications nerveuses de l'ulcere de l'estomac (polyneurites et pseudotabes polyneuritiques). Presse med 19: 733 (Sept 23) 1911. Libert E. Stenose ulceuse du pilore accompagnée de pseudotabes polyneuritiques chez un syphilitique ancien. Arch d mal de l'app digestif 20: 493 (April) 1930.

8 Haas S A. Beriberi in Late Infancy. The Result of Celiac Disease. Arch Pediat 46: 467 (Aug) 1929. Keefer C S and Yang C S. The Treatment of Secondary Anemia. Arch Int Med 48: 557 (Oct) 1931. Jones C M. Peripheral Complications of Ulcerative Colitis. M Clin North America 16: 919 (Jan) 1933. Kohn S. Mitteilungen über einige seltene Krankheitsfälle aus der privaten Praxis. Prager med. Wchn chr 35: 554 1910. Viet H R and Allen A W. Unpublished observations quoted by Lorry Ragle Allen and Jones Groen.

vitamin in the diet about twenty days may be required for the appearance of the first symptoms<sup>24</sup>. Should no treatment be instituted, the end stages may be reached within a matter of weeks. However, most patients suffer from a partial and irregular deficiency of the vitamin. Months may accordingly elapse before marked symptoms appear. With temporary increases in the amount of the vitamin ingested, remissions occur, these are followed by exacerbations as the diet again becomes inadequate. Some individuals may continue for long periods in a relatively stationary condition while partaking of diets containing an amount of vitamin B which is insufficient for recovery but enough to prevent further progression. Severely acute cases probably represent acute exacerbations precipitated perhaps by infections or excessive physical activity in persons who have had unrecognized mild symptoms of the disease for some time<sup>9</sup>.

It is not generally difficult to differentiate the clinical picture of vitamin B<sub>1</sub> deficiency from other forms of polyneuritis. In lead poisoning, as a rule, only the motor nerves and the anterior horn cells of the spinal cord are affected. Involvement of sensation is minimal and pain is rare. The upper extremity is more often affected. First there is a weakness of the hand, and this is followed by wrist drop within a few days. Foot drop occurs later. A history of colic, the appearance of a characteristic line on the gingival margins and basic stippling of the erythrocytes further aid in establishing the diagnosis. Polyneuritis due to the toxic action of the other heavy metals closely simulate the form due to lead.

Polyneuritis due to the toxic action of triorthocresyl phosphate, an occasional contaminant of Jamaica ginger, and apiol and other abortifacients, like that due to poisoning by the heavy metals, is essentially motor in type. The onset is usually abrupt, with complete development of paralysis within a few days. Cresyl phosphate usually first affects the nerves of the legs, however. Many patients present foot drop alone. More advanced cases exhibit involvement of the hands and arms. Pain in the calves, without much tenderness, is a common but transient symptom at the onset. Disturbances of sensation are minimal.

Infectious polyneuritis (polyneuritis, polyneuritis with facial diplegia) affects the proximal rather than the peripheral portions of the limbs. Involvement of the shoulder girdle and the upper thighs together with the cranial nerves, especially the seventh, is characteristic. The spread of weakness is toward the periphery rather than from it. Generally the protein content of the cerebrospinal fluid is increased, whereas in polyneuritic beriberi changes, if any, are slight.

Diphtheria produces an ascending perineural lymphogenous intoxication commencing at the site of the infection. Faucial diphtheria thus first results in palatal paralysis, laryngeal diphtheria in laryngeal paralysis, only later spreading to contiguous centers in the nervous system. When the lesion is on the buttocks, as in diphtheritic saddle sores, the polyneuritis commences with involvement of the sacral nerves and then spreads up the cord.

Arsenical polyneuritis most closely simulates beriberi. However, this condition usually occurs after acute poisoning rather than from chronic intoxication, and hence

the history is usually significant. Sensory changes are frequently more marked than motor changes. Burning, pain and paresthesias are particularly pronounced.

#### CARDIOVASCULAR MANIFESTATIONS OF VITAMIN B<sub>1</sub> DEFICIENCY

The cardiovascular manifestations of beriberi most commonly encountered are dyspnea and palpitation on exertion, tachycardia and edema<sup>10</sup>. The heart is generally enlarged both to the right and to the left. Systolic murmurs are common. Basilar pulmonary rales are frequent. The arterial blood pressure is usually normal or low, frequently with an increased pulse pressure. On palpation a bounding quality is noted in the larger arteries and "pistol shot" sounds may be heard on auscultation. The venous pressure is generally increased but may be normal<sup>11</sup>. The skin is usually warm and of normal color<sup>11</sup>. Cyanosis is rare, edema may be mild and only in dependent parts, or diffuse and extreme. Electrocardiograms generally show alterations, chiefly in the T waves<sup>12</sup>. Circulatory failure may be predominantly right sided or left sided. Sudden circulatory collapse (shock) has been observed, as well as syncope due to hypersensitivity of the carotid sinus<sup>11</sup>.

It is thus apparent that the cardiovascular manifestations of vitamin B<sub>1</sub> deficiency do not, at least in the present state of our knowledge, comprise a rigid and easily recognized clinical syndrome. Furthermore, not infrequently rheumatic, arteriosclerotic or syphilitic heart disease may have superimposed injury due to vitamin B<sub>1</sub> deficiency.

However, there are technical measurements of the circulation which may prove to be of significant value in the differentiation of beriberi from other types of cardiovascular disorders. The circulatory minute volume and circulation time are both increased<sup>13</sup> in the cardiovascular complications of beriberi whereas other causes of congestive failure, except hyperthyroidism, result in conspicuous slowing of the circulation. The important points in establishing the diagnosis of cardiovascular disease dependent on deficiency of vitamin B<sub>1</sub> are, in addition to those points already presented, (1) the presence of other manifestations of vitamin B<sub>1</sub> deficiency, such as polyneuritis, or of deficiencies of other portions of the B complex, such as glossitis and pellagrous skin changes. Indeed it is rare to observe "beriberi heart" without at least minimal signs of polyneuritis, (2) the history of dietary inadequacy or of conditioning factors which lead to vitamin B<sub>1</sub> deficiency in spite of an apparently normal diet, (3) the disappearance of signs and symptoms following adequate B<sub>1</sub> therapy.

#### OTHER MANIFESTATIONS OF VITAMIN B<sub>1</sub> DEFICIENCY

A deficiency of vitamin B<sub>1</sub> leads to gastro-intestinal symptoms, chiefly anorexia and nausea. On the administration of vitamin B<sub>1</sub> these promptly disappear. There

10 Aalsmeer W C and Wenkebach K F. Herz und Kreislauf bei der Beriberikrankheit. *Wien Arch f inn Med* 16 193 (Jan) 1929. Miura K. Beriberi oder Kakle. *Ergebn. d inn Med u Kinderh* 4 280 1909. Shimazono J. Bavitaminosis und Beriberi. *ibid* 39 1 1931. Keefer<sup>4</sup> Weiss and Wilkins footnotes 11 and 12.

11 Weiss Soma and Wilkins R W. The Nature of the Cardiovascular Disturbances in Vitamin Deficiency States. *Tr A Am Physicians* 51 341 1936.

12 (a) Weiss Soma and Wilkins R W. The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi). *Ann Int Med* 11 104 (July) 1937. (b) footnote 11.

13 Inawashiro R and Hayasaka E. Studies on the Effect of Muscular Exercise in Beriberi. *Tohoku J Exper Med* 12 1 (Dec 30) 1928. Weiss and Wilkins footnotes 11 and 12.

<sup>9</sup> Vedder E B. Beriberi. In: *Text-Book of Medicine*. Hagers town Md. W F Prior Company. 1929. vol 1A.

is, however, no method of differentiating a priori which clinical cases of anorexia and nausea are due to  $B_1$  deficiency unless associated signs of  $B_1$  deficiency are present. Even then such symptoms may be due not to a nutritional deficiency but to some associated condition such as alcoholic gastritis. There is, therefore, no justification for the indiscriminate treatment of anorexia with vitamin  $B_1$ . Similarly, although retardation of growth is found in  $B_1$  deficiency, in the case of most underdeveloped children other causes are to be sought. Glossitis, achlorhydria, anemia and diarrhea are not infrequently seen in patients with vitamin  $B_1$  deficiency. The evidence now at hand suggests, however, that these phenomena are manifestations of a deficiency of some portion of the vitamin B complex other than  $B_1$ .

A decade ago there was a failure on the part of many clinicians to recognize that vitamin  $B_1$  deficiency was responsible for many cases of polyneuritis and cardiovascular dysfunction. Today the pendulum may be swinging too far in the opposite direction. There are instances in which lead poisoning, mediastinal tumors, cardiovascular syphilis and other conditions are being diagnosed as beriberi and treated as such to the exclusion of appropriate therapeutic measures. When doubt exists as to diagnosis, no harm will be done by administering vitamin  $B_1$ , but full investigation of the individual case must be carried out.

#### VITAMIN $B_1$ THERAPY

Vitamin  $B_1$  may be employed in pure crystalline form or substances rich in vitamin  $B_1$  content may be administered. For the definitely diagnosed case of beriberi, treatment may well be initiated by the intramuscular or intravenous injection of from 20 to 50 mg of crystalline vitamin  $B_1$  daily. This amount has appeared to be sufficient in all cases thus far observed and probably represents an excess over the actual requirement. However, overdosage entails no harm. As much as 100 mg has been administered intravenously<sup>12a</sup> in one dose without ill effects of any kind. After a fortnight oral therapy may be employed in the same dosage or, if injections are continued, the dose is decreased to 10 mg daily until the patient is completely relieved of all symptoms.

Brewers' yeast, plain or autolyzed, serves as a convenient means of administering not only vitamin  $B_1$  but other portions of the B complex. Thirty grams of a powdered brewers' yeast of good potency administered three times daily will generally suffice for the treatment of the less seriously ill patients with vitamin  $B_1$  deficiency, particularly if there is no reason to suspect the presence of gastro-intestinal disturbances which might interfere with the absorption of orally administered products. Since fatal vasomotor collapse can appear without warning in untreated patients with beriberi heart, it is of utmost importance that the administration of vitamin  $B_1$  be commenced promptly.

It has often been pointed out that deficiency disease in man, unlike that experimentally produced in animals, is seldom limited to a single factor. A diet deficient in vitamin  $B_1$  may possibly be low in other portions of the vitamin B complex as well as in vitamins A and C and in iron and other minerals. The frequent occurrence of glossitis, anemia and pellagra in association with beriberi suggests that many patients without such manifest signs nevertheless suffer from partial deficiency of other dietary factors. It is accordingly wise to provide that a patient with beriberi

receive, in addition to proper amounts of vitamin  $B_1$ , an adequate amount of vitamins A and C and iron, as well as food rich in other portions of the vitamin B complex. The dilute liver extracts, suitable for intramuscular injection, given in dosage of from 10 to 20 cc or more daily, have been particularly valuable in controlling glossitis and skin manifestations of the pellagrous type.

The results of vitamin  $B_1$  therapy in both the polyneuritic and the cardiovascular manifestations of beriberi are most gratifying. When the polyneuritis is acute and not far advanced, one may observe complete remission of signs and symptoms in a matter of weeks. When, however, the nerve degeneration has been progressive over a long period of time and has reached a severe stage, a correspondingly long period will be required before complete recovery occurs. Peripheral nerves are capable of regeneration as long as the cell body in the spinal cord or posterior ganglion remains viable. Since this regeneration commences at the cell body and progresses distally at a rate of approximately 1 mm a day, it is apparent that months will be required for the complete repair of advanced degeneration. Therefore, treatment must continue unrelentingly until this occurs. Regeneration of completely degenerated cells and axis cylinders within the central nervous system does not take place. Accordingly, complete recovery of functions lost as a result of cerebral or posterior column cord degeneration cannot be expected, even though marked improvement in these functions not infrequently occurs.

The response of the cardiovascular system to adequate vitamin  $B_1$  therapy is often dramatic. Within a few days the pulse rate is slowed, diuresis occurs and edema lessens. Within a fortnight the patient may lose 20 pounds (9 Kg) or more of edema fluid, the electrocardiogram may return to normal, the heart may become noticeably smaller and the vital capacity of the lungs may increase markedly. In deficiency of long duration anatomic changes may occur in the heart muscle,<sup>12a</sup> so that five weeks or more may be required for the remission of all signs and symptoms. Repair of neural lesions in most instances occurs at an even slower rate than that of cardiovascular disturbances.

It should be emphasized that, striking as the results of vitamin  $B_1$  therapy are in the cardiovascular disturbances arising from a deficiency of vitamin  $B_1$ , no effects whatever are to be expected in other types of heart disease, with or without edema, in the edema of pregnancy toxemias,<sup>14</sup> nephrosis and the like.

Other papers in this series bring out the limitations of our knowledge concerning the human requirements for vitamin  $B_1$  and the vitamin  $B_1$  content of foods. More definite data will be available in the future as the efforts of research workers in the laboratory and in the clinic continue unabated. The reports reviewed in the present paper indicate, within the limitations of the technique heretofore available, that vitamin  $B_1$  deficiency is probably more commonly found in the United States than has been supposed. This condition is observed chiefly in association with diseases or bodily states that condition a deficient supply of vitamin  $B_1$ . The encouraging feature of clinical reports is that the condition is readily amenable to therapy.

270 Commonwealth Avenue

14. Strauss, M. B. Observations on the Etiology of the Toxemias of Pregnancy. III. The Lack of Influence of Vitamin L ( $B_1$ ) on Water Retention in the Toxemias of Pregnancy. *Am. J. M. Sc.* 1:37 (in press.)

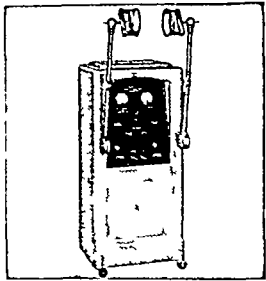
## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION  
OF THE FOLLOWING REPORT HOWARD A CARTER Secretary

### HANOVIA ULTRA SHORT WAVE, MODEL 2711 ACCEPTABLE

Manufacturer Hanovia Chemical and Manufacturing Company, Newark, N J

The Hanovia Ultra Short Wave Generator, Model 2711, is recommended for medical and surgical diathermy. This unit may be used with cuff electrodes, air-spaced electrodes and an induction coil. It has a wavelength of approximately 6 meters. Being a cabinet model, the unit is designed for use in hospitals or offices. It is housed in a walnut frame and has a bakelite instrument panel. The unit weighs approximately 160 pounds.



Hanovia Ultra Short Wave Unit  
Model 2711

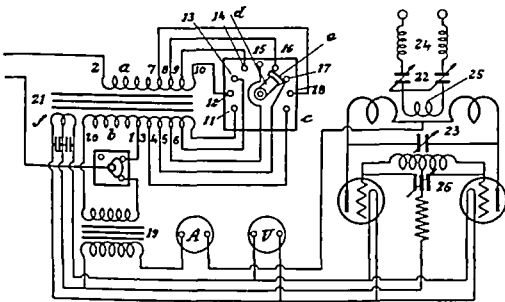
A two tube circuit is utilized with a frequency of 50,000,000 cycles per second. It is provided with a switching arrangement which adjusts it to variations in line voltage from 100 to 140 volts so that filament, plate and grid of the oscillating tubes operate at their correct values.

The patient circuit is inductively coupled and has two variable air-spaced condensers for tuning the patient, operating from one control. The two legs of the patient's circuit are tuned simultaneously by this switch.

A voltmeter is provided on the panel so that the electronic emission from the tubes may be kept constant under all operating conditions. A milliammeter is provided in the plate circuit of the tubes to indicate when resonance is obtained in the patient circuit. The oscillating circuits are so coupled that the maximum plate current reading corresponds to circuit resonance, enabling the operator to adjust the machine for most efficient performance. The electrical characteristics are so designed as to make it impossible for the operator to overload the machine when using air spaced condensers, cuff electrodes or bare metal ones.

When the machine is operated at full load it consumes about 1,250 watts from the alternating current line. The output of the unit is approximately 450 watts. Output measurements are procured by the photo electric cell method, using an incandescent bulb and galvanometer calibrated in watts. The temperature rise of the transformer and the rise taken at various levels inside the cabinet are within the limits of safety. While burns may be produced with this as well as with other short wave units, they may be avoided by the use of ordinary precaution.

To reduce radio interference to a minimum, a choke is used in series with the primary side of the transformer. If the



Schematic diagram of circuit

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The temperature rise of the transformer and the rise taken at various levels inside the cabinet are within the limits of safety. While burns may be produced with this as well as with other short wave units, they may be avoided by the use of ordinary precaution.

To reduce radio interference to a minimum, a choke is used in series with the primary side of the transformer. If the

air-spaced treatment arms are used some disturbance may result as the result of a stray field, which is emitted by them in the air-spaced position.

The firm submitted evidence to show the heating ability of the unit when applied to the human thigh. Tests were performed with air-spaced electrodes, cuff electrodes and the inductance coil. The technical procedure for making the tests was that recommended by the Council on Physical Therapy. A cannula was introduced at the midpoint of the thigh and inserted for a distance of about 2 inches or until the bone was encountered. Temperature readings were taken by means of thermocouples inserted into the cannula and constructed of constantan and copper placed in hypodermic needles. The constant temperature junction was kept at 0 C by means of a vacuum bottle and crushed ice. The couples were calibrated against a mercury thermometer certified and calibrated by the United States Bureau of Standards. Potential differences were read from a Leeds and Northrup portable potentiometer of requisite sensitivity. The accuracy is believed to be within one tenth of a degree. Average temperatures for the various technics are given here.

#### Averages of Six Observations, Air-Spaced Technic

Deep Muscle		Oral	
Initial	Final	Initial	Final
98.9	104.7	98.7	99.0

The technic used for the foregoing tests was as follows: 4½ inch circular disks were placed on the anterior aspect of the thigh, from 1½ to 1¾ inches from the thigh and 11 inches apart. Transformer step No 4 was used.

The next six observations were made by means of the cuff technic. Cuffs measuring 3¼ by 16 or 3¼ by 23¾ inches were employed. These were placed on the anterior aspect of the thigh, over three-fourths inch of felt spacing, and 8 inches apart from center to center. Transformer step No 5 was used. The averages for six observations with this technic are given here.

#### Averages of Six Observations Cuff Technic

Deep Muscle		Oral	
Initial	Final	Initial	Final
98.8	106.0	98.5	98.9

Another set of observations was made with the induction coil. Here one-half inch towel spacing was placed between the coils and the skin. The cable was wrapped around the thigh in four turns, 1½ inches from center to center of turns. Transformer step No 5 was used. The average temperatures are given here.

#### Averages of Six Observations Inductance Coil Technic

Deep Muscle		Oral	
Initial	Final	Initial	Final
98.3	105.5	98.3	99.0

The firm did not submit evidence concerning this unit as a generating source for hyperpyrexia treatments or deep pelvic heating.

The unit was tried out clinically by an investigator appointed by the Council and found to give sufficient heat with the air-spaced, cuff and inductance coil electrodes to warrant the claims made for it by the manufacturer.

In view of the foregoing report, the Council on Physical Therapy voted to include the Hanovia Ultra Short Wave, Model 2711 in its list of accepted devices.



## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C. BING, Secretary

### SUMMIT MINERAL SPRING WATER

*Manufacturer*—Mineral Waters, Inc., Harrison, Maine

*Description*—Bottled spring water of low mineral content, practically free of micro organisms

*Collection and Bottling*—Water is pumped through galvanized pipes from a covered spring, located in boulder clay over rock granite at 1,000 feet above sea level, to a galvanized storage tank. After being filtered twice, the water is stored in a stone tank, then bottled. The bottling house is equipped with brass pipes. All equipment is inspected and cleaned periodically. Bottles are soaked in a 3 per cent solution of caustic alkali at 49 C for twenty minutes, brushed inside and out and rinsed three times.

*Chemical Analysis* (submitted by manufacturer)—Parts per million: silica 22.02, sodium nitrate 1.645, potassium chloride 0.657, sodium chloride 4.424, sodium sulfate 2.353, sodium carbonate 12.587, magnesium carbonate 7.536, calcium carbonate 6.782, iron oxide 0.097, aluminum oxide 7.266, organic and volatile matter 14.0.

*Sanitary Analysis* (submitted by manufacturer)—Turbidity none, color none, sediment slight-vegetable, odor, 20 C, very faint vegetable. Parts per million: nitrogen as free ammonia 0.004, albuminoid ammonia 0.016, nitrites trace, nitrates 0.3, hardness 13. Alkalinity (pH) 7.0, chlorine (Cl) 1.0.

*Microscopic Organisms*—Bacteria per cubic centimeter (37.5 C) 32, B. coli absent.

### ROCKWOOD'S CHOCOLATE FLAVOR SYRUP

*Manufacturer*—Rockwood and Company, Brooklyn

*Description*—Chocolate flavored syrup prepared from sucrose syrup, water, cocoa and sodium bicarbonate (trace), flavored with vanillin and coumarin.

*Manufacture*—Cocoa is added to hot sugar syrup and the mixture thoroughly mixed and blended. The batch is heated and then allowed to cool with constant beating. Flavoring is added. The syrup mixture is homogenized and automatically packed in cans, sealed and pasteurized.

*Analysis* (submitted by manufacturer)—Moisture 39.8%, total solids 60.2%, ash 0.6%, fat (ether extract) 1.2%, protein (N × 6.25) 2.3%, reducing sugars as invert sugar 9.9%, sucrose 39.7%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 55.5%, total nitrogen 0.34%, theobromine 0.30%, caffeine 0.05%, pH 5.6.

*Calories*—24 per gram, 68 per ounce.

### BORDEN'S CHATEAU

*Manufacturer*—The Borden Company, New York

*Description*—Mixture of Cheddar cheese, cream, skim milk powder, water, disodium phosphate, sodium chloride, sodium citrate, citric acid and annatto.

*Manufacture*—Cheddar cheese of good quality, free of mold and discoloration, is cut into pieces and ground with a definite proportion of skim milk powder. The mix with fixed quantities of the remaining ingredients is passed through a heating trough, mixed and heated to 68 C. The molten mass is discharged into mixing kettles, is agitated until homogeneous and conveyed to packaging machines. Measured quantities are automatically sealed in tin foil packed in cartons and refrigerated.

*Analysis* (submitted by manufacturer)—Moisture 42.0%, total solids 58.0%, ash 5.4%, sodium chloride (NaCl) 3.0%, calcium 0.60%, fat (ether extract) 27.3%, protein (N × 6.38) 19.3%, lactose 5.0%, crude fiber none, carbohydrates (by difference) 6.0%.

*Calories*—3.47 per gram, 99 per ounce.

*Vitamins*—An excellent source of vitamin A and contains vitamins B and G.

### DALE BRAND TOMATO JUICE

*Manufacturer*—Orleans County Canning Company, Albion, N. Y. (Factory at Barre Center, N. Y.)

*Description*—Canned tomato juice seasoned with salt, retaining in high degree the natural vitamin content.

*Manufacture*—Selected tomatoes are washed, inspected, trimmed and crushed. The juice is extracted, heated and automatically filled into cans, which are sealed, processed in retorts and cooled.

*Analysis* (submitted by manufacturer)—Moisture 94.8%, total solids 5.2%, ash 1.0%, sodium chloride 0.65%, fat (ether extract) 0.1%, protein (N × 6.25) 0.8%, reducing sugars as invert sugar 1.2%, sucrose 1.2%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 3.2%, vitamin C (titration) 10.9 mg per hundred cubic centimeters (218 international units).

*Calories*—0.2 per gram, 6 per ounce.

*Vitamins*—The product contains 68 International units of vitamin C per fluidounce.

### KIND AND KNOX EDIBLE GELATIN

SUPFR XX (250 BLOOM JELLY STRENGTH), SUPFR X (225 BLOOM JELLY STRENGTH), SUPREME (200 TEST), HIGH PRIME (175 TEST) AND PRIME (150 TEST) GRADES.

*Manufacturer*—Kind and Knox Gelatine Company, Camden, N. J. (Affiliate of Knox Gelatine Company, Johnstown, N. Y.)

*Description*—Unflavored, unsweetened granular gelatin, graded on the basis of jelly strength.

*Manufacture*—The gelatin is made from dephosphated bone or ossein, and from skins. The method of manufacture is the same as that described for Knox Plain Sparkling Gelatin (No. 1) (THE JOURNAL, March 14, 1931, p. 861).

*Analysis* (submitted by manufacturer)—Bone Gelatin: Moisture 11.0 to 12.0%, ash 0.9 to 1.5%, protein (N × 5.55) (by difference) 88.1 to 86.5%, pH 5.9 to 6.2. Skin Gelatin: Moisture 11.0 to 12.0%, ash 0.3 to 1.0%, protein (N × 5.55) (by difference) 88.7 to 87.0%, pH 4.2 to 4.7.

*Calories*—3.5 per gram, 99 per ounce.

### BO PO'S DIETARY DRESSING

*Manufacturer*—Arthur E. Shannon, 131 Franklin Park West, Columbus, Ohio.

*Description*—Contains mineral oil, vinegar, salt, mustard, paprika, Worcestershire sauce, tabasco sauce and saccharin. Seasoned with garlic.

*Manufacture*—Spiced vinegar is prepared by steeping definite amounts of ground garlic in formula proportions of cider vinegar. Worcestershire sauce, tabasco sauce and saccharin are added and the mixture allowed to stand until the desired flavor is developed. Definite proportions of salt, mustard, paprika, spiced vinegar and mineral oil are then mechanically mixed and packed in clean glass bottles.

*Analysis* (submitted by manufacturer)—Moisture 12.2%, total solids 87.8%, ash 3.1%, fat (ether extract) 83.6%, protein (N × 6.25) 0.8%, sucrose none, reducing sugars none, crude fiber 0.28%, total carbohydrates 0.35%.

*Calories*—Practically none.

### SUNRAYS WHEAT SELEX

*Manufacturer*—Sun Ray Products Company, Grand Rapids, Mich.

*Description*—Wheat cereal containing the embryo and considerable of the bran.

*Manufacture*—Soft winter wheat is scoured and aspirated by the usual milling procedure. The outer coat or epidermis is removed and the wheat is ground, heated to 200 F for a period of two minutes, cooled and packed.

*Analysis* (submitted by manufacturer)—Moisture 10.1%, total solids 89.9%, ash 1.3%, protein (N × 5.7) 9.8%, fat (ether extract) 2.2%, crude fiber 1.5%, total carbohydrates other than crude fiber (by difference) 75.1%.

*Calories*—3.6 per gram, 92 per ounce.

# HOSPITAL SERVICE IN THE UNITED STATES

## SEVENTEENTH ANNUAL PRESENTATION OF HOSPITAL DATA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Among the outstanding facts revealed by the Annual Census of Hospitals for 1937 just completed by the Council on Medical Education and Hospitals, are

Persons in 1937 entered hospitals at the rate of one every 3.4 seconds

The rate of growth in hospitals is equivalent to one hospital of seventy-six beds for each day, Sundays and holidays included

New hospitals in addition to the 6,128 already registered include 100 hospitals opened but whose registration is pending, seventy under construction, and 179 planned and being developed

The rate of occupancy in general hospitals is 70 per cent of capacity

pitals admitted 8,349,773 patients, or 90.5 per cent of the total admissions to all registered hospitals

The average daily census of empty beds was 180,112 in 1937, 188,205 in 1936 and 199,629 in 1935. The census showed an average of 123,811 empty beds in general hospitals

Eighty-six state mental hospitals reported an average census more than 15 per cent in excess of rated capacity and seven exceeded their capacity by more than 50 per cent

The types of special hospitals whose figures show a downward trend for their institutions, as a group, are maternity hospitals, industrial, isolation, and the hospital departments of institutions. Maternity hospitals

### SUMMARY OF HOSPITAL DATA

	Number	Beds	Bassinets	Patients Admitted in 1937
1 Registered hospitals and sanatoriums approved for training interns and residents	954	372,838	24,502	4,860,709
2 Other hospitals, sanatoriums and related institutions, registered	5,174	751,710	31,064	4,360,808
Total registered	6,128	1,124,548	55,566	9,221,517
3 Refused registration after investigation (capacity 18,624)				Number 617
4 Unclassified, emergency stations, clinics, offices, cottages, and so on, with bed care (capacity unknown)				2,260
5 Prospective hospitals and sanatoriums				
a Opened Registration pending				100
b Under construction				70
c Planned Construction pending				179

There are 6,128 hospitals, 1,124,548 beds, 55,566 bassinets, 932,912 births, 944,436 average census and 9,221,517 patients admitted

Thanks to cooperative superintendents and directors, reports were received from 97.6 per cent of hospitals representing 99.4 per cent of total capacity. Comparisons with the preceding year showed a gain of 27,827 beds and 1,341 bassinets. There were 101,412 more babies born in hospitals and 574,632 more patients admitted. The average census was greater by 35,920.

The figures for "patients admitted" and "average daily census of patients" throughout this article are exclusive of newborn infants and do not include outpatients.

One person in fourteen became a hospital bed patient during the year 1937, the division being based on the population estimated by the United States Bureau of the Census as of July 1, 1937. The average length of stay in general hospitals was 12.6 days.

The total patient days in all hospitals was 344,719,140, a gain of 12,202,284 over the preceding year. The patient days in general hospitals numbered 105,222,200, or 30.5 per cent of the total. The 4,245 general hos-

pital departments of institutions dropped in number from 125 to 114, in beds from 6,402 to 5,466, in bassinets from 3,846 to 3,487, in patients admitted from 67,925 to 59,949, and in average census from 4,065 to 3,480.

### THE ANNUAL CENSUS AND THE RESPONSE

The response to the annual census was indeed remarkable, being 97.6 per cent of all the registered hospitals. This is an all time record for our annual census and represents over 99.4 per cent of the capacity of all hospitals addressed. Returns are still coming in, especially from the proof submitted to each hospital to obtain final data for the American Medical Directory, which is also being revised.

The 732 hospitals approved for intern training and 465 approved for residencies in specialties, making a total of 954 excluding duplicates, all reported—a straight 100 per cent response. Statistical and other data of importance regarding internships and residencies are given farther on in the present article. The special survey and inspection of schools for clinical laboratory technicians, physical therapists, and occupational therapists also are described in later pages.

THE ANNUAL CENSUS QUESTIONNAIRE FOR 1937  
The questionnaire—Hospital Information Blank—that was sent to 5,310 hospitals registered but not approved for intern training or residencies was mailed in October 1937. It included the following questions:

Name of institution in full    Year established    Street number    City    State    Name of corporation, organization, or individual having control    Superintendent or administrative head (Add proper title, as M.D., R.N., Mr., Mrs., Miss)

Character of cases treated—check classifications: ☐ Children's, ☐ Chronic, ☐ Convalescent and Rest, ☐ Drug and Alcoholic, ☐ Ear, Nose and Throat, ☐ Epileptic, ☐ Eye, ☐ Industrial, ☐ Isolation, ☐ Maternity, ☐ Mentally Deficient, ☐ Nervous, ☐ Mental, ☐ Skin and Cancer, ☐ Orthopedic, ☐ Surgical, ☐ Tuberculosis, ☐ Venereal, Other

Summary of Growth of Hospitals 1909 to 1937

Year	Federal Hospital		State Hospitals		All Other Hospitals		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1909	71	8,827	232	189,049	4,036	223,189	4,339	421,065
1914	93	12,602	294	232,834	4,630	287,045	5,037	532,481
1918	110	18,815	303	262,254	4,910	331,152	5,323	612,211
1923	220	53,869	691	307,203	6,069	399,645	6,830	755,722
1928	294	61,765	595	369,759	5,963	461,410	6,852	892,934
1931	291	69,170	576	419,282	5,746	455,663	6,613	974,115
1932	301	74,151	568	442,601	5,693	497,602	6,562	1,014,354
1933	295	75,635	567	459,648	5,535	491,765	6,437	1,027,046
1934	313	77,865	544	473,035	5,477	497,201	6,334	1,048,101
1935	316	83,353	520	453,994	5,404	507,792	6,246	1,075,139
1936	323	84,234	524	503,306	5,342	509,181	6,189	1,096,521
1937	329	97,951	522	508,913	5,277	517,684	6,128	1,124,548

Ownership or control: Please check type of organization owning or controlling hospital: (a) Governmental—☐ Federal, ☐ State, ☐ City, ☐ County, ☐ City-County, (b) Nonprofit organizations—☐ Church, ☐ Fraternal, ☐ Other nonprofit organization, (c) Proprietary—☐ Individual, ☐ Partnership, ☐ Corporation (unrestricted as to profit)

Number of beds (all except bassinets) (Do not count beds for nurses or other employees)    Bassinets (For newborn only)    Total patients admitted for the latest twelve months period available (Do not include newborn, stillborn or outpatients)    Total deaths (For same period)    Do not count stillbirths)    Total births in same period (Total live babies born)    Average daily census of patients in hospital (Total patient days divided by 365)    Do not include newborn infants or outpatients)    Does the hospital maintain an organized outpatient department?    Number of patients served in outpatient department during report year    Number of visits by these outpatients during report year

Has the hospital its own clinical laboratory? (Answer yes or no)    If the hospital has its own clinical laboratory, who is the director? (Add proper title, as M.D.)    If any laboratory work is sent out, to whom is it sent? (Add proper title, as M.D.)    Do you send out the following kinds of work (Answer yes or no):    Tissues    Parasitology    Serology    Bacteriology    Hematology    Biochemistry

Has the hospital its own x-ray department? (Answer yes or no)    If so, who is director? (Add proper title as M.D.)

If the hospital has no x-ray department: (a) To whom is your radiologic work referred?    (b) Name of director (Add proper title, as M.D.)    Do you have apparatus for roentgenography?    Fluoroscope    Roentgenotherapy (Answer yes or no)

Do you have interns?    Number    Resident Physicians    Number (Kindly list interns and resident physicians on the back of this sheet)

Are hospital privileges limited strictly to qualified physicians having the M.D. degree? (Answer yes or no)

Do you have a school of nursing?    Number of students now in training

If you publish an annual report kindly send copy

Space also was provided in which hospitals reported (a) names of medical staff, including all physicians

using the hospital's facilities in any way, (b) names of all resident physicians, specifying the type and duration of each service, (c) names of all interns, together with medical college of graduation and the beginning and end of intern service

SPECIAL ANNUAL SURVEY OF INTERNSHIPS

As usual, a special annual questionnaire was sent to all of the hospitals approved for internships and for residencies in specialties for the calendar year. It was mailed Dec. 28, 1937, and included all the questions asked in the foregoing questionnaire—Hospital Information Blank—and, in addition, the following questions:

Chief or president of staff    Hospital pathologist    Time spent at hospital    Hospital radiologist    Time spent at hospital    Chairman of intern committee    Give approximate percentages    Free patients    Part pay patients    Full pay patients

Deaths and Autopsies (Give figures, not percentages), Stillbirths    Autopsies    Coroner's or medical examiner's cases    Autopsies    All other deaths    Autopsies

INTERNSHIPS—Kindly supply us with a copy of your intern schedule or indicate below the type of internships you offer, whether straight, mixed or rotating. If straight internships are provided, please indicate in which departments and for what length of time.

Note: Rotation through surgery, medicine, obstetrics, pediatrics and the laboratories is considered a full rotating schedule. A straight internship is a service limited to one clinical department. A service between these two limits is interpreted as a mixed internship.

How many interns do you require?    Length of internships (Months)    When are appointments to internships made?    By whom?    Do you require personal interviews?    Competitive examinations?    When do internships begin?

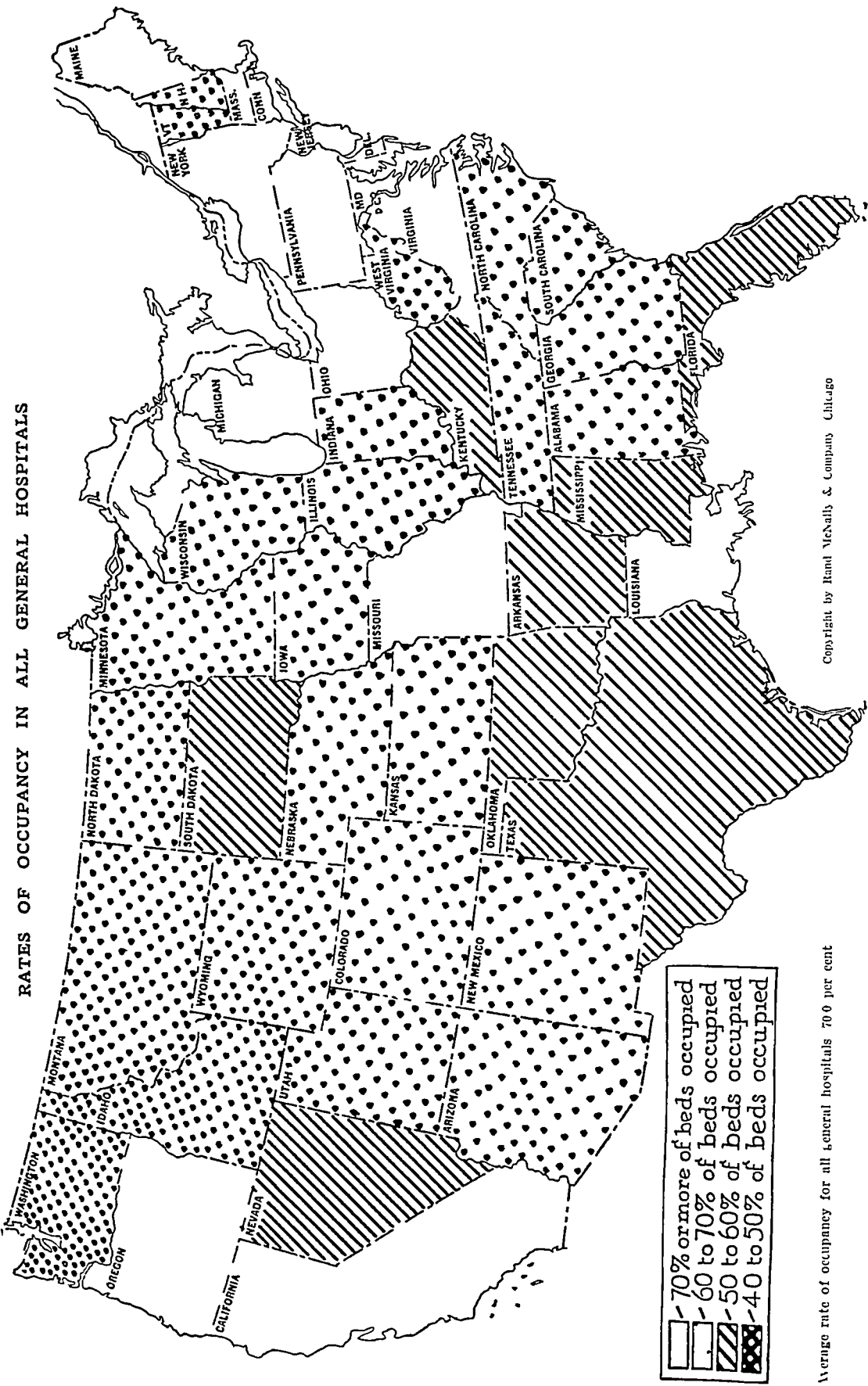
Births in Hospitals

	1929	1936	1937
According to Ownership or Control			
Federal	2,296	6,390 <sup>1</sup>	6,675
State	9,125	19,360	18,820
County	17,527	49,032	46,707
City	43,767	74,149	71,441
City-county	8,806	9,220	10,014
Total governmental	83,511	151,151	153,490
Church	209,726	265,901	306,115
Fraternal	1,700	1,422	1,875
Associations and restricted corporations	4,327	224,894	365,946
Industrial	253,136		
Independent associations			
Total nonprofit		692,217	671,927
Individual and partnership	39,456	39,897	49,851
Corporations (unrestricted as to profit)		47,805	61,719
Total proprietary		87,702	111,570
Total nongovernmental	5,333	619,919	715,311
According to Type of Service			
General	568,177	783,855	855,211
Maternity	53,019	41,310	43,449
Children	862	1,161	1,161
Hospital departments of institutions	2,7	1,369	1,369
All other hospitals	1,361	616	401
Total births in all hospitals	621,890	831,300	907,910

Have affiliations for special intern services been established?    With what hospitals?    For what services?    Compensation for interns    Salary per month    Bonus    Do you supply full maintenance to interns?    Uniforms?    How many internships are open to women?    Do you employ residents on general service in the hospital as chief house officers?    How many?

SPECIAL ANNUAL SURVEY OF RESIDENCIES IN SPECIALTIES

Residencies in specialties offered by 465 hospitals were surveyed by questionnaire and also by personal visit by a member of the Council's staff where possible.



Average rate of occupancy for all general hospitals 70.0 per cent

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Occupancy in General Hospitals

The percentages of beds occupied in general hospitals during the year 1937, by states, were as follows

Alabama	64.4	District of Columbia	70.7	Kansas	62.3	Minnesota	67.9	New Jersey	72.2	Oregon	70.6	Utah	67.5
Arizona	61.8	Florida	57.9	Kentucky	58.1	Mississippi	60.1	New Mexico	62.1	Pennsylvania	72.2	Vermont	67.3
Arkansas	71.0	Georgia	66.4	Louisiana	77.6	Missouri	70.5	New York	62.1	Rhode Island	70.5	Virginia	71.3
California	71.1	Idaho	6.6	Maine	70.9	Montana	61.1	North Carolina	77.8	South Carolina	70.5	Washington	64.7
Colorado	64.6	Illinois	11.2	Maryland	74.0	Nebraska	62.4	North Dakota	61.6	South Dakota	63.4	West Virginia	63.1
Connecticut	72.1	Indiana	67.1	Massachusetts	72.1	Nevada	60.8	Ohio	62.6	Tennessee	66.7	Wisconsin	69.1
Delaware	71.5	Iowa	61.7	Michigan	78.6	New Hampshire	66.4	Oklahoma	59.2	Texas	57.3	Wyoming	69.8

Methods and results of the personal visit are reported in later pages of this article. The inquiry concerning residencies covered all questions in the foregoing questionnaires and also elicited, regarding residency offered, name of chief of service, number of inpatients treated, outpatient service available, number of resi-

The total number of hospitals registered is 6,128, which have a capacity of 1,124,548 beds and 55,566 bassinets.

#### INCREASES AND DECREASES IN FACILITIES AS TO TYPES OF SERVICE

General hospitals made a marked increase in number and also in their capacity and their occupancy figures. The nervous and mental dropped in number but increased in capacity and occupancy. Tuberculosis and orthopedic hospitals increased in number, capacity, admissions and average daily census. There are now 4,245 general hospitals as compared with 4,207 for the previous year. The bed capacity is 412,091 as compared with 402,605 for the previous year. Bassinets now number 51,668, a gain of 2,064. Patients admitted numbered 8,349,773, a gain of 593,925, and the average census was 288,280, a gain of 16,622.

Totals According to Type of Service, 1937  
Condensed from Table 2

	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Patient Days
General	4,245	412,091	51,668	8,349,773	288,280	10,922,200
Nervous and mental	579	570,616	124	19,624	546,906	199,620,690
Tuberculosis	508	76,751	3	101,859	64,890	2,062,000
Maternity	114	5,466	3,457	39,949	3,480	1,240,700
Industrial	36	2,833		41,078	1,549	560,550
Eye, ear, nose and throat	39	1,946	3	9,941	1,115	406,910
Children's	51	5,389	111	89,854	3,714	1,330,610
Orthopedic	7	6,880	10	33,010	5,063	2,030,490
Isolation	56	6,187	21	37,290	2,633	961,040
Convalescent and rest	120	5,466	38	29,411	3,960	1,447,920
Hospital departments of institutions	240	21,821	61	144,189	14,498	5,291,770
All other hospitals	6	9,000	8	44,809	7,933	2,809,430
<b>Totals</b>	<b>6,128</b>	<b>1,124,548</b>	<b>55,666</b>	<b>9,221,517</b>	<b>944,436</b>	<b>34,719,140</b>

dents employed, number of assistant residents, when service begins, deaths occurring in service, autopsies performed, number of months training provided, and beginning salary per month.

The present census of hospitals covers, for all practical purposes, the calendar year 1937. The gain of 27,827 beds in the year is entirely consistent with the figures for the past twenty-nine years, since 1909. During that time the annual increase in hospital facilities has amounted to a permanent net gain of between

Percentage of Beds Occupied

	1929	1933	1936	1937
<b>According to Ownership or Control</b>				
Federal	76.8	75.0	81.6	82.5
State	94.6	94.5	95.1	95.5
County	50.7	53.8	57.1	6.3
City	74.5	83.0	82.9	81.8
City-county	80.2	75.5	76.6	73.0
<b>Total governmental</b>	<b>88.9</b>	<b>90.1</b>	<b>91.2</b>	<b>91.1</b>
Church	66.7	54.9	65.9	68.6
Fraternal	68.7	64.0	67.6	67.0
Associations and restricted corporations			66.0	70.6
Industrial	4.4	41.4		
Independent associations	65.9	85.5		
<b>Total nonprofit</b>			<b>65.8</b>	<b>69.7</b>
Individual and partnership	54.2	41.1	47.9	1.6
Corporations (unrestricted as to profit)			77.7	8.7
<b>Total proprietary</b>			<b>28</b>	<b>11.0</b>
<b>Total nongovernmental</b>	<b>64.6</b>	<b>53.3</b>	<b>65.6</b>	<b>61.2</b>
<b>According to Type of Service</b>				
General	65.5	19.9	67.4	70.0
Nervous and mental	91.7	91.1	91.6	91.8
Tuberculosis	82.7	85.3	85.8	84.4
Maternity	62.8	60.8	65.5	63.7
Industrial	34.6	42.2	48.6	54.6
Eye, ear, nose and throat	47.7	46.2	47.3	47.3
Children's	65.9	65.9	64.8	65.0
Orthopedic	50.2	70.9	80.9	80.9
Isolation	61.1	41.2	41.8	47.6
Convalescent and rest	70.9	69.2	69.4	71.2
Hospital departments of institutions	63.0	60.1	70.7	64.4
All other hospitals	74.6	65.7	81.0	85.1
<b>Total all hospitals</b>	<b>80.1</b>	<b>77.8</b>	<b>82.8</b>	<b>84.0</b>

20,000 and 30,000 beds each year. The accumulative nature of this gain is obvious, since hospital facilities are not a commodity that is used up but represents a permanent addition. The hospital facilities, therefore, were added to during the year 1937 at a rate equal to the completion of a seventy-six bed hospital for each day in the year, Sundays and holidays included.

Unoccupied Beds in Hospitals

	1929	1936	1937
<b>According to Ownership or Control</b>			
Federal	13,868	10,482	17,157
State	21,664	24,528	21,017
County	12,620	11,264	12,804
City	14,688	13,449	14,440
City-county	2,807	2,989	9,411
<b>Total governmental</b>	<b>64,627</b>	<b>67,000</b>	<b>69,809</b>
Church	37,780	39,201	36,110
Fraternal	1,606	1,491	1,581
Associations and restricted corporations		53,481	46,830
Industrial	3,107		
Independent associations	54,494		
<b>Total nonprofit</b>		<b>94,327</b>	<b>81,000</b>
Individual and partnership	17,343	11,874	14,499
Corporations (unrestricted as to profit)		19,019	11,608
<b>Total proprietary</b>		<b>30,893</b>	<b>26,107</b>
<b>Total nongovernmental</b>	<b>114,716</b>	<b>121,900</b>	<b>110,703</b>
<b>According to Type of Service</b>			
General	193,021	1,004,177	1,023,811
Nervous and mental	18,910	23,919	23,710
Tuberculosis	10,603	10,196	11,801
Maternity	2,022	2,737	1,866
Industrial	3,190	1,623	1,260
Eye, ear, nose and throat	1,283	1,000	831
Children's	1,857	1,877	1,677
Orthopedic	1,117	1,206	1,717
Isolation	4,741	4,010	5,001
Convalescent and rest	1,846	1,818	1,601
Hospital departments of institutions	9,118	7,982	7,733
All other hospitals	2,261	1,601	1,067
<b>Total unoccupied beds—all hospitals</b>	<b>180,367</b>	<b>1,88,700</b>	<b>1,80,117</b>

The unusual gain in the number of general hospitals is accounted for by the opening up of an increasing number of small general hospitals in rural districts and the reclassification of certain related types of institutions which have been developing through the years toward general hospital service. Some hospitals also that have started out as special hospitals have become general hospitals.

A potent factor in the rising figures concerning general hospitals is the increasing use of them in specialties, such as tuberculosis, orthopedic and nervous and mental, as well as in general medical and surgical services.

Mental hospitals showed a decline in number from 584 to 579, while the capacity increased to the present level of 570,616 beds, an increase of 21,664 beds during the year. Patients admitted numbered 195,624, an increase of 10,688, and the average census was 546,906, an increase of 21,913.

Tuberculosis hospitals now number 508, a net gain of two institutions but they have 76,751 beds, an unusual gain of 3,059 beds during the year. To them

Table 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL A GOVERNMENT HOSPITALS

Marginal No		Federal				State				County				City				City and County				Total Governmental					
		Hospitals	Beds	Patients	Average	Hospitals	Beds	Patients	Average	Hospitals	Beds	Patients	Average	Hospitals	Beds	Patients	Average	Hospitals	Beds	Patients	Average	Hospitals	Beds	Patients	Average		
1	Alabama	6 2170	6 9180	5 016	6 020	7 6233	6 233	5 016	6 020	5 640	46	11 926	455	3 243	30	9 351	160	2 133	8	1 512	60	23	9 437	90	36 885	8 466	
2	Alaska	20 1840	70 1341	4 362	6 163	2 6108	1 608	4 362	6 163	3 310	20	6 741	230	3 241	20	3 201	9	1	20	4	750	12	23	9 437	90	36 885	
3	Arizona	4 1663	6 408	1 500	1 500	6 319	6 319	1 500	1 500	6 319	6 319	1 500	1 500	6 319	6 319	1 500	1 500	3	261	5	14 618	1 770	100	52 644	738	15 201	
4	Arkansas	20 7073	63 753	5 793	5 793	15 25740	25 740	5 793	5 793	15 25740	25 740	5 793	5 793	15 25740	25 740	5 793	5 793	1	261	5	14 618	1 770	100	52 644	738	15 201	
5	California	5 1934	10 3068	1 463	1 463	4 7440	4 740	1 463	1 463	4 7440	4 740	1 463	1 463	4 7440	4 740	1 463	1 463	2	641	1	18 885	344	20	11 404	105	36 042	
6	Colorado	1 265	4 222	1 512	1 512	14 10203	10 203	1 512	1 512	14 10203	10 203	1 512	1 512	14 10203	10 203	1 512	1 512	4	801	27	7 800	520	13	10 938	203	44 202	
7	Connecticut	8 3393	2 842	8 060	8 060	6 5280	6 528	8 060	8 060	6 5280	6 528	8 060	8 060	6 5280	6 528	8 060	8 060	5	2 363	117	19 330	1 938	20	7 969	198	48 524	
8	Dist of Columbia	5 7569	2 638	6 021	6 021	5 7785	7 061	2 638	6 021	5 7785	7 061	2 638	6 021	5 7785	7 061	2 638	6 021	5	1 143	124	27 400	672	30	12 156	271	63 697	
9	Florida	3 4418	25 1625	2 133	2 133	4 1566	4 156	2 133	2 133	4 1566	4 156	2 133	2 133	4 1566	4 156	2 133	2 133	7	756	67	8 004	528	2	7 969	198	48 524	
10	Georgia	8 4418	25 1625	2 133	2 133	4 1566	4 156	2 133	2 133	4 1566	4 156	2 133	2 133	4 1566	4 156	2 133	2 133	7	756	67	8 004	528	2	7 969	198	48 524	
11	Idaho	10 5714	7 1945	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	12	2 164	42	14 618	1 770	100	52 644	738	15 201	
12	Illinois	4 1926	4 145	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	72	51 304	364	147 984	48 653	12	72	51 304	364	147 984
13	Indiana	4 1926	4 145	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	72	51 304	364	147 984	48 653	12	72	51 304	364	147 984
14	Iowa	4 1926	4 145	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	18 12 646	12 646	1 841	1 841	72	51 304	364	147 984	48 653	12	72	51 304	364	147 984
15	Kansas	7 1720	13 15913	1 15	1 15	13 7 641	7 641	1 15	1 15	13 7 641	7 641	1 15	1 15	13 7 641	7 641	1 15	1 15	1	70	10	148	60	35	14 925	139	48 653	
16	Kentucky	7 1720	13 15913	1 15	1 15	13 7 641	7 641	1 15	1 15	13 7 641	7 641	1 15	1 15	13 7 641	7 641	1 15	1 15	1	70	10	148	60	35	14 925	139	48 653	
17	Louisiana	4 1661	4 8001	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	4	610	16	2 800	560	1	10 947	115	33 770	
18	Maine	3 408	5 8845	1 669	1 669	4 131	4 131	1 669	1 669	4 131	4 131	1 669	1 669	4 131	4 131	1 669	1 669	11	150	30	3 376	11	1	150	30	3 376	
19	Maryland	8 3013	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	31	6 638	416	82 680	4 866	77	43 471	464	11 349	
20	Massachusetts	10 5714	7 1945	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	1	30	600	20	600	20	77	43 471	464	11 349
21	Michigan	8 3013	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	30	600	20	600	20	77	43 471	464	11 349
22	Minnesota	8 3013	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	30	600	20	600	20	77	43 471	464	11 349
23	Mississippi	1 1623	7 606	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	1	1040	72	11 637	723	18	6 644	279	58 200	
24	Missouri	5 1477	6 785	1 041	1 041	12 1 566	1 566	1 041	1 041	12 1 566	1 566	1 041	1 041	12 1 566	1 566	1 041	1 041	1	1040	72	11 637	723	18	6 644	279	58 200	
25	Montana	3 3971	5 321	202	202	4 2 920	2 920	202	202	4 2 920	2 920	202	202	4 2 920	2 920	202	202	1	30	600	20	600	20	77	43 471	464	11 349
26	Nebraska	4 1661	4 8001	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	1	70	10	148	60	35	14 925	139	48 653	
27	Nevada	4 1661	4 8001	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	1	70	10	148	60	35	14 925	139	48 653	
28	New Hampshire	1 1623	7 606	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	1	1040	72	11 637	723	18	6 644	279	58 200	
29	New Jersey	10 5714	7 1945	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	30 3604	36 040	5 226	5 226	1	30	600	20	600	20	77	43 471	464	11 349
30	New York	16 1 3971	5 321	202	202	4 2 920	2 920	202	202	4 2 920	2 920	202	202	4 2 920	2 920	202	202	1	30	600	20	600	20	77	43 471	464	11 349
31	North Carolina	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	2	132	8 0	78	2	51	4	359	34	19
32	North Dakota	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	2	132	8 0	78	2	51	4	359	34	19
33	Ohio	13 1 571	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	34	121	122	166	127	431	1 236	366 669	
34	Oklahoma	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	1	34	121	122	166	127	431	1 236	366 669	
35	Oregon	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	1	34	121	122	166	127	431	1 236	366 669	
36	Rhode Island	2 226	2 066	1 140	1 140	4 2 920	2 920	1 140	1 140	4 2 920	2 920	1 140	1 140	4 2 920	2 920	1 140	1 140	2	132	8 0	78	2	51	4	359	34	19
37	South Carolina	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	1	34	121	122	166	127	431	1 236	366 669	
38	South Dakota	6 2627	5 1008	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	23 2 7543	2 754	2 302	2 302	1	34	121	122	166	127	431	1 236	366 669	
39	Tennessee	13 1 571	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	34	121	122	166	127	431	1 236	366 669	
40	Texas	13 1 571	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	34	121	122	166	127	431	1 236	366 669	
41	Utah	3 176	4 1660	1 150	1 150	4 2 920	2 920	1 150	1 150	4 2 920	2 920	1 150	1 150	4 2 920	2 920	1 150	1 150	2	132	8 0	78	2	51	4	359	34	19
42	Vermont	1 1623	7 606	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	12 1 566	1 566	1 344	1 344	1	1040	72	11 637	723	18	6 644	279	58 200	
43	Virginia	8 3013	6 9681	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	30 32 540	32 540	2 467	2 467	1	30	600	20	600	20	77	43 471	464	11 349
44	Washington	14 2 641	22 13 055	2 063	2 063	11 5 039	5 039	2 063	2 063	11 5 039	5 039	2 063	2 063	11 5 039	5 039	2 063	2 063	5	808	37	9 111	707	13	10 947	115	33 770	
45	West Virginia	4 1661	4 8001	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178	1 75	1 75	6 7 178	7 178												



were admitted 101,839 patients, and the average census was 64,800

The orthopedic hospitals made an increase in number from seventy-one to seventy-five in beds from 6,333 to 6,880 and in number of patients admitted from 30,499 to 33,015. The average census of patients in orthopedic hospitals increased from 5,127 to 5,563.

Industrial hospitals declined in number from forty-four to thirty-six in beds from 3,159 to 2,835 and in patients admitted from 41,862 to 41,028, but their

loss of forty-two during the year. The beds in such institutions number 21,821, and the average census 14,498. A hospital department of an institution is usually designed to take care of its inmates only. When the management finds out that better care can be given or more economy effected with existing hospitals in the community, the institutional hospital closes.

The types of hospitals that have remained static, or practically so, as between the years 1936 and 1937 are the eye, ear, nose and throat hospitals, children's hos-

TABLE 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL  
B NONPROFIT ORGANIZATIONS

Marginal No	Church					Fraternal					Nonprofit Corporations and Associations					Total Nonprofit					Marginal No	
	Hospitals	Beds	Basements	Patients Admitted	Average Census	Hospitals	Beds	Basements	Patients Admitted	Average Census	Hospitals	Beds	Basements	Patients Admitted	Average Census	Hospitals	Beds	Basements	Patients Admitted	Average Census		
1	Alabama	7	64	79	18 2	44					19	1 375	116	39 336	788	26	2 017	190	50 610	1 2 3	1	
2	Arizona	9	879	91	17 824	360	1	21	21	19	10	402	31	5 693	195	20	1 906	122	23 642	774	2	
3	Arkansas	9	964	83	20 800	227	1	72	72	57	7	38	42	8 760	213	17	1 569	123	30 283	794	3	
4	California	42	4 840	868	126 061	3 360	3	346	10	3 909	243	67	5 912	816	122 616	4 201	112	11 107	1 694	2 2 586	7 0 0	4
5	Colorado	29	2 619	327	46 344	1 701	2	261	10	1 4	97	21	2 242	78	13 907	1 062	52	5 122	403	60 383	1 364	5
6	Connecticut	5	1 013	229	30 714	802					3	5 046	723	100 189	3 888	40	6 121	602	120 903	4 690	6	
7	Delaware						1	70	12	1 376	40	7	625	101	15 478	479	8	703	113	17 04	592	7
8	Dist. Columbia	4	786	130	26 196	63					10	1 466	310	7 145	1 194	14	2 332	440	63 341	1 877	8	
9	Florida	7	717	113	14 079	374	3	160	8	1 234	170	21	1 133	164	20 629	577	33	2 030	233	33 322	1 041	9
10	Georgia	3	446	72	14 131	344	1	64		201	60	19	1 208	133	29 832	774	23	1 738	207	44 278	1 118	10
11	Idaho	11	718	140	18 001	430					3	63	8	1 630	30	14	781	148	19 041	480	11	
12	Illinois	87	11 731	1 903	232 866	7 460	4	338	23	1 074	203	89	8 429	1 410	189 517	5 544	173	20 498	3 340	447 434	13 199	12
13	Indiana	29	3 770	614	98 914	2 607	1	87		24	40	18	1 233	213	27 627	733	48	5 078	627	126 184	3 400	13
14	Iowa	43	4 150	603	81 683	2 308	1	63	12	47	24	24	1 163	200	21 042	627	68	5 378	803	102 737	3 181	14
15	Kansas	37	2 952	453	73 889	1 84	1	200	1,197	69	24	823	140	17 223	438	62	4 025	604	82 309	2 310	15	
16	Kentucky	12	1 619	224	41 488	1 123	1	20	91	14	23	1 411	140	23 060	786	38	3 110	373	64 639	1 923	16	
17	Louisiana	10	1 333	142	39 903	9	2	122	13	899	78	13	1 042	76	22 423	645	27	2 549	231	63 227	1 067	17
18	Maine	5	363	41	7 770	247					22	1 441	220	28 393	1 030	27	1 804	261	36 368	1 206	18	
19	Maryland	9	1 973	176	32 793	1 341					37	3 788	360	60 120	2 862	36	5 713	536	92 913	4 401	19	
20	Massachusetts	16	2 353	418	44 612	1 990	1	60	41	32	114	10 017	1 813	213 049	7 746	131	13 662	2 233	268 076	9 888	20	
21	Michigan	33	3 953	669	102 087	2 824	2	170	333	131	60	6 132	880	134 249	4 637	93	10 277	1 549	236 674	7 682	21	
22	Minnesota	33	3 450	528	87 482	2 470	1	60	176	60	43	2 617	446	64 404	1 750	70	6 187	974	147 152	4 280	22	
23	Mississippi	2	185	22	6 063	103					21	968	118	19 845	438	23	1 133	140	23 910	546	23	
24	Missouri	39	5 622	770	108 712	4 001	4	338	1 710	230	27	2 394	312	38 443	1 500	70	8 334	1 052	143 863	5 160	24	
25	Montana	23	1 793	311	33 152	1 104					6	191	44	5 246	143	20	1 084	335	40 393	1 247	25	
26	Nebraska	25	2 038	342	50 077	1 332					5	197	37	6 705	129	33	2 733	379	56 872	1 601	26	
27	Nevada	1	54	12	1 661	30					2	6	10	673	29	3	119	22	2 331	39	27	
28	New Hampshire	5	339	64	7 794	242					23	1 112	199	22 039	693	23	1 431	263	29 833	9	28	
29	New Jersey	18	3 246	430	63 384	2 282	2	133	140	60	68	8 769	1 303	184 414	6 434	88	12 130	1 733	247 938	8 788	29	
30	New Mexico	14	970	81	11 812	327					9	332	27	7 742	138	23	1 302	112	13 334	68	30	
31	New York	78	11 894	1 343	183 352	9 106	4	413	1 090	249	215	30 007	3 818	597 011	22 619	297	42 314	5 366	793 633	31 941	31	
32	North Carolina	13	1 016	123	26 190	763	2	92	384	26	70	3 969	604	93 453	2 523	87	5 077	629	124 937	3 312	32	
33	North Dakota	20	1 605	234	34 264	1 018					9	343	69	6 462	186	29	1 933	273	40 726	1 901	33	
34	Ohio	43	6 000	967	135 076	4 947	4	417	1 394	293	87	7 333	1 093	171 462	5 191	134	14 370	2 062	331 132	10 431	34	
35	Oklahoma	11	922	178	24 036	617	3	143	19	2 861	90	7	234	28	4 034	128	21	1 349	223	30 931	804	35
36	Oregon	16	1 922	267	52 391	1 332	1	30	23	30	11	101	88	8 876	299	28	2 473	336	61 502	1 901	36	
37	Pennsylvania	39	6 068	772	106 440	4 325	5	380	1 271	343	194	27 568	3 139	473 562	19 111	238	32 016	3 911	583 233	23 781	37	
38	Rhode Island	3	432	43	4 873	290					13	1 838	338	32 060	1 340	16	2 310	381	26 933	1 030	38	
39	South Carolina	3	343	47	9 638	238					21	1 439	138	33 604	976	20	1 937	210	44 640	1 142	39	
40	South Dakota	14	1 016	175	21 439	625					10	344	80	6 831	183	24	1 420	230	23 390	811	40	
41	Tennessee	16	1 071	142	35 279	861					23	1 718	134	27 706	1 126	31	2 791	296	63 933	1 937	41	
42	Texas	46	4 133	551	111 499	2 493	4	311	13	2 442	279	31	1 763	166	37 109	896	61	6 913	730	131 030	3 121	42
43	Utah	6	957	171	22 888	716	1	20	69	30	4	183	49	5 234	100	11	1 190	220	27 411	836	43	
44	Vermont	3	213	27	4 927	166					17	1 730	146	23 901	1 747	20	1 304	173	28 823	1 131	44	
45	Virginia	3	344	38	8 811	163	1	133	13	2 677	73	32	1 196	268	30 119	1 433	37	2 675	321	63 611	1 666	45
46	Washington	21	2 330	437	55 251	1 343	1	20	115	20	26	1 891	364	43 201	1 338	48	4 441	801	93 601	2 901	46	
47	West Virginia	9	973	116	13 390	341					18	1 440	126	29 170	949	27	2 413	242	47 760	1 190	47	
48	Wisconsin	61	6 433	1 071	173 967	4 247					28	1 791	253	40 183	1 973	89	8 976	1 038	173 152	3 183	48	
49	Wyoming	2	45	10	1 033	22					4	83	17	1 793	44	6	1 0	27	2 834	69	49	
50	Totals (1937)	913	113 243	16 381	2 193 114	79 113	61	4 736	123	32 123	3 905	1 637	137 688	21 733	3 168 917	111 303	2 693	27 717	33 362	696 150	19 621	50
51	(1936)	969	133 283	16 360	2 266 044	74 037	64	4 833	116	33 037	3 341	1 618	137 630	21 122	2 979 631	104 169	2 711	27 574	37 593	723 712	18 171	51
52	(1935)	970	113 268	16 033	1 930 398	69 332	69	5 300	141	33 976	3 620	1 601	149 940	19 973	2 493 251	94 463	2 640	263 375	36 132	4 477 315	17 630	52
53	(1934)	910	113 263	16 067	1 756 223	63 331	72	5 411	150	34 700	3 601	1 604	149 030	20 034	2 242 313	89 613	2 616	267 712	35 251	4 163 733	13 957	53
54	(1933)	834	113 540	16 199	1 533 366	62 621	72	5 399	132	30 817	3 457											
55	(1932)	1 001	117 333	16 123	1 918 214	70 119	74	5 530	132	41 390	3 706											
56	(1931)	1 011	116 933	16 615	2 013 332	73 911	76	5 323	161	44 390	3 820											
57	(1930)	1 017	116 546	16 615	2 013 332	73 911	76	5 323	161	44 390	3 820											
58	(1929)	1 024	113 333	16 615	2 013 332	73 911	76	5 323	161	44 390	3 820											
59	(1928)	1 033	114 613	13 190			87	5 323	161		3 677											
60	(1927)	1 060	103 332				85	4 933			3 193											

Tables 1 and 2 record conditions as of Dec. 31 1937. Discrepancies between these figures and those found in the list beginning on page 986 are due to the fact that the list was revised to March 15 1938.

average daily census of patients increased from 1,536 to 1,549.

Isolation hospitals continued about the usual downward slide, from sixty-one to fifty-six, the beds being reduced from 6,896 to 6,187. There was also a steady decline in the average census.

The hospital departments of institutions, frequently called "institutional hospitals" which have shown a marked decline over a period of years continued the downward trend. They now number 240, marking a net

Under convalescent and rest we have included only those institutions whose patients are under medical care—in other words where, as a rule, there is medical supervision over the care and treatment of patients. The number is 120, ten less than last year, with a bed capacity of 5,566 as compared with 6,039 last year. The number of patients admitted and the average census remained about the same.

Details regarding hospitals of all types of service are shown in table 2 and special attention is directed to

tana, Nebraska, New Hampshire, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Texas, Washington and West Virginia.

Illinois reduced its number of hospitals during the year by thirteen, New York by fourteen, Ohio by two, Tennessee by four, Virginia by two, Wisconsin by three and Wyoming by two. The number of beds increased in all states except Delaware, Kentucky, Nevada and South Dakota. The total number of bassinets in all hospitals increased during the year from

Table 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL C PROPRIETARY

Marginal No		Individual and Partnership					Corporations (Unrestricted as to Profit)					Total Proprietary					Totals of Tables 1B and 1C					Marginal No
		Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	
1	Alabama	28	979	122	10,934	377	7	410	53	9,496	197	35	1,359	175	25,430	574	61	3,406	3,406	1,897	1	
2	Arizona	10	255	22	672	116	3	92	13	1,803	47	13	347	35	2,475	163	33	1,653	1,653	937	2	
3	Arkansas	21	492	54	8,941	164	5	178	22	1,633	38	26	670	76	10,394	202	43	2,239	2,239	996	3	
4	California	110	3,557	503	57,616	2,218	42	2,311	354	45,963	1,512	152	5,668	857	103,639	3,730	264	16,977	2,551	356,225	11,709	4
5	Colorado	26	582	82	8,504	329	4	257	8	1,659	125	30	839	90	10,163	457	82	5,961	495	70,048	3,821	5
6	Connecticut	4	69	4	1,064	46	13	660	4	1,444	497	17	729	8	2,508	483	57	6,850	960	133,411	5,173	6
7	Delaware						1	15	6	242	7	1	15	6	242	7	9	718	119	17,296	529	7
8	Dist of Columbia	3	60	4	348	36						3	60	4	348	36	17	2,412	444	63,659	1,863	8
9	Florida	24	612	99	9,808	236	5	195	35	3,827	76	29	807	134	13,635	312	62	2,837	410	48,957	1,383	9
10	Georgia	41	1,060	113	20,030	564	12	510	78	14,904	314	53	1,630	191	34,934	878	78	3,388	398	79,212	2,056	10
11	Idaho	14	334	63	7,137	152	4	97	22	2,272	54	18	431	85	9,409	206	32	1,212	233	25,460	686	11
12	Illinois	33	727	102	8,229	407	26	1,904	269	31,812	1,039	59	2,631	371	40,041	1,446	232	23,129	3,711	487,495	14,645	12
13	Indiana	18	292	80	5,783	154	10	492	42	8,807	265	28	784	122	14,590	419	76	5,562	949	140,774	3,819	13
14	Iowa	37	565	135	10,301	254	7	201	23	2,903	127	44	766	158	13,204	351	112	6,144	961	115,941	3,563	14
15	Kansas	16	283	46	3,849	136	4	155	17	2,480	103	20	438	63	6,329	239	82	4,463	667	88,638	2,609	15
16	Kentucky	15	403	38	4,899	186	16	555	51	11,590	292	31	957	89	16,489	418	69	4,067	462	81,128	2,405	16
17	Louisiana	17	353	46	8,728	134	11	562	65	17,826	360	28	915	111	26,554	494	53	3,464	342	89,781	2,200	17
18	Maine	15	428	78	5,777	233	10	339	69	7,258	206	25	767	147	12,835	439	52	2,571	408	49,203	1,745	18
19	Maryland	7	255	4	741	225	6	306	40	3,976	149	13	601	40	4,717	374	49	6,814	576	97,632	4,777	19
20	Massachusetts	21	470	100	5,768	243	24	1,337	207	22,681	814	45	1,807	307	28,449	1,057	176	15,460	2,540	296,525	10,845	20
21	Michigan	38	794	133	15,695	505	10	498	45	5,033	363	48	1,292	178	20,728	868	143	11,069	1,227	2,740	8,000	21
22	Minnesota	64	1,007	258	17,799	464	15	1,020	65	25,017	578	79	2,027	323	42,816	1,042	158	8,214	1,297	189,968	5,322	22
23	Mississippi	28	893	116	18,717	331	5	180	24	4,375	73	33	1,013	149	23,092	404	56	2,226	280	49,002	950	23
24	Missouri	29	734	165	8,187	318	9	361	54	4,188	204	38	1,095	219	12,375	522	108	9,449	1,301	161,940	6,282	24
25	Montana	10	189	57	3,690	80	3	167	20	3,521	91	13	356	77	7,211	171	42	2,340	432	47,609	1,418	25
26	Nebraska	44	680	186	12,223	278	3	149	15	1,426	125	47	829	201	13,649	403	80	3,584	590	70,521	2,064	26
27	Nevada						1	35	7	1,012	23	1	35	7	1,012	23	4	154	29	3,346	102	27
28	New Hampshire						6	382	80	6,423	284	6	382	80	6,423	284	34	1,833	348	36,256	1,219	28
29	New Jersey	11	232	27	1,692	138	14	723	56	4,611	371	25	955	83	6,303	509	113	13,105	1,836	254,241	9,294	29
30	New Mexico	7	198	26	3,404	76	2	50	7	374	9	9	178	33	3,778	85	32	1,480	145	19,332	770	30
31	New York	64	2,508	520	24,637	1,318	46	3,699	713	62,392	2,307	110	5,957	1,233	87,029	3,625	407	48,271	6,599	880,682	35,599	31
32	North Carolina	26	838	61	14,734	503	14	765	65	12,735	403	40	1,603	116	27,469	906	127	6,680	745	162,406	4,218	32
33	North Dakota	7	89	34	1,059	36	2	39	8	941	16	9	126	42	2,500	52	38	2,081	369	43,226	1,256	33
34	Ohio	22	666	46	7,170	408	21	1,966	41	5,262	1,000	43	2,032	87	12,432	1,408	177	16,402	2,149	343,564	11,839	34
35	Oklahoma	50	1,405	216	29,776	561	18	795	117	15,182	770	68	2,200	333	44,438	931	89	3,549	558	75,409	1,753	35
36	Oregon	13	338	62	6,426	185	12	360	71	11,828	282	25	898	133	18,254	467	33	3,371	489	79,756	2,368	36
37	Pennsylvania	36	1,006	154	9,848	566	11	667	108	13,213	383	47	1,673	262	23,061	949	285	33,659	4,173	606,314	24,733	37
38	Rhode Island	2	34	5	57	30						2	34	5	57	30	18	2,344	381	643,306	1,660	38
39	South Carolina	9	239	32	5,971	116	2	85	6	1,884	64	11	324	38	6,955	180	40	2,261	248	51,595	1,522	39
40	South Dakota	11	212	50	4,019	98	3	111	18	2,213	76	14	323	68	6,592	174	38	1,743	323	34,982	985	40
41	Tennessee	30	776	61	12,932	319	11	350	44	6,839	150	41	1,126	105	19,771	469	72	3,917	401	83,756	2,456	41
42	Texas	111	2,341	337	53,992	1,005	45	1,823	208	44,709	950	156	4,164	545	98,701	1,953	237	10,377	1,275	249,751	5,576	42
43	Utah	10	173	64	3,116	78	2	52	13	771	17	12	225	77	3,687	95	23	1,415	207	31,998	931	43
44	Vermont	2	24	2	243	11	3	73	10	822	29	5	97	10	1,065	40	2	2,051	183	29,893	1,534	44
45	Virginia	22	1,132	86	22,907	579	20	1,102	127	25,738	697	42	2,234	213	48,770	1,126	79	4,909	334	112,316	3,902	45
46	Washington	23	531	113	9,263	255	10	393	61	8,021	205	33	924	174	17,284	440	81	5,365	975	115,885	3,341	46
47	West Virginia	16	702	69	24,406	490	18	1,426	116	39,273	881	34	2,128	185	63,679	1,281	61	9,441	427	111,439	2,771	47
48	Wisconsin	30	888	170	10,498	299	13	559	44	6,295	354	43	1,147	214	17,246	613	132	9,423	1,222	190,398	6,135	48
49	Wyoming	8	132	32	1,999	63	1	20	5	320	7	0	152	37	2,319	70	15	282	64	5,153	136	49
50	Totals (1937)	1,183	29,957	4,766	508,359	15,458	580	25,085	3,516	507,077	16,477	1,713	58,042	8,282	1,015,496	31,935	4,406	335,759	46,644	6,711,592	225,556	50
51	(1936)	1,204	25,496	4,546	437,797	13,612	550	28,511	3,629	497,457	16,462	1,754	57,007	7,985	935,254	30,134	4,465	332,881	45,583	6,194,026	211,681	51
52	(1935)	1,255	29,913	4,384	413,997	14,212	627	34,946	4,357	532,990	18,697	1,882	64,850	8,741	946,587	32,900	4,522	333,427	44,893	5,424,102	200,580	52
53	(1934)	1,310	29,429	4,891	366,313	12,046	629	33,072	4,038	458,303	15,985	1,939	67,501	8,429	824,616	28,051	4,585	330,214	44,680	4,988,551	185,095	53
54	(1933)	1,435	33,355	4,962	381,861	13,746											4,661	332,573	44,619	4,882,444	184,197	54
55	(1932)	1,522	25,759	5,094	428,256	16,309											4,758	334,987	44,572	5,178,598	195,277	55
56	(1931)	1,560	36,764	5,352	459,184	17,912											4,873	332,501	44,232	5,322,895	206,095	56
57	(1930)	1,620	38,557	5,233		19,948											4,907	336,143	43,281		212,645	57
58	(1929)	1,611	34,977	5,212		20,604											4,870	324,596	41,877		209,511	58
59	(1928)	1,699	39,710	4,843													5,039	325,500	37,641			59
60	(1927)	1,682	39,118			21,779											4,998	308,149			201,615	60

Tables 1 and 2 record conditions as of Dec 31, 1937. Discrepancies between these figures and those found in the list beginning on page 986 are due to the fact that the list was revised to March 15, 1938.

the footings which give comparisons by years, showing figures for each year from 1927 to 1937 inclusive.

The occupancy table on comparison of hospital data for 1936 and 1937 is a roll call of states summarizing the number of hospitals, capacity, births, patients admitted, and the average census for the hospitals of each state. While the total number of hospitals shows a decrease of sixty-one, there was an actual increase in some states, naturally those having a large rural population, including Florida, Louisiana, Mississippi, Mon-

54,225 to 55,566. Rather interesting, whether significant

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE

Marginal No		General				Nervous and Mental				Tuberculosis				Maternity				Industrial				Eye Ear Nose and Throat				
		Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	
1	Alabama	69	9,051	411	101,829	2,062	5,834	2,062	5,834	18	1,700	3,381	1,228	1	45	25	108	36	2	27	4,008	104	1	10	827	3
2	Arizona	41	2,118	206	40,007	1,000	2,833	1,000	2,833	15	1,700	3,381	1,228	1	30	20	40	3	2	27	4,008	104	1	10	827	3
3	Arkansas	29	2,118	206	40,007	1,000	2,833	1,000	2,833	15	1,700	3,381	1,228	1	30	20	40	3	2	27	4,008	104	1	10	827	3
4	California	292	29,217	3,109	512,218	21,133	20,114	21,133	20,114	17	5,897	7,784	1,068	7	38	165	112	27	3	663	7,601	404	2	32	2,012	20
5	Colorado	40	6,000	1,000	114,000	2,000	4,918	2,000	4,918	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
6	Connecticut	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
7	Delaware	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
8	District of Columbia	1	1,000	100	10,000	1,000	1,000	1,000	1,000	1	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
9	Florida	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
10	Georgia	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
11	Idaho	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
12	Illinois	212	6,138	7,600	183,537	19,811	19,811	19,811	19,811	20	3,000	4,000	1,000	7	35	17	165	4	1	7	1,319	31	2	234	6,706	242
13	Indiana	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
14	Iowa	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
15	Kansas	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
16	Kentucky	22	7,000	700	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
17	Louisiana	17	7,000	700	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
18	Maine	10	800	123	19,334	1,000	1,000	1,000	1,000	3	300	300	300	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
19	Maryland	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
20	Massachusetts	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
21	Michigan	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
22	Minnesota	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
23	Mississippi	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
24	Missouri	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
25	Montana	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
26	Nebraska	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
27	Nevada	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
28	New Hampshire	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
29	New Jersey	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
30	New Mexico	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
31	New York	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
32	North Carolina	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
33	North Dakota	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
34	Ohio	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
35	Oklahoma	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
36	Oregon	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
37	Pennsylvania	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
38	Rhode Island	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
39	South Carolina	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
40	South Dakota	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
41	Texas	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
42	Utah	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
43	Vermont	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
44	Virginia	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
45	Washington	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000	1,000	1	10	10	10	10	1	10	1,000	100	1	10	1,000	100
46	West Virginia	11	700	1,000	100,000	1,000	1,000	1,000	1,000	10	1,000	1,000														

Tables 1 and 2 record conditions as of Dec 31 1937. Discrepancies between these figures and those found in the list beginning on page 986 are due to the fact that the list was revised to March 15 1938.

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE—Continued

Marginal No	Children's					Orthopedic			Isolation			Convalescent and Rest			Hospital Departments of Institutions			All Other Hospitals			Totals			
	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census
1	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	1
2	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	2
3	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	3
4	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	4
5	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	5
6	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	6
7	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	7
8	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	8
9	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	9
10	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	10
11	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	11
12	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	12
13	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	13
14	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	14
15	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	15
16	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	16
17	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	17
18	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	18
19	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	19
20	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	20
21	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	21
22	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	22
23	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	23
24	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	24
25	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	25
26	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	26
27	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	27
28	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	28
29	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	29
30	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	30
31	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	31
32	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	32
33	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	33
34	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	34
35	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	35
36	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	36
37	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	37
38	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	38
39	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	39
40	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	40
41	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	41
42	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	42
43	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	43
44	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	44
45	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	45
46	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	46
47	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	47
48	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	48
49	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	49
50	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	50
51	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	51
52	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	52
53	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	53
54	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	54
55	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	55
56	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	56
57	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	57
58	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	58
59	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	59
60	Albany	1	60	538	37	2	8	1,201	98	1	10	1,60	7	5	164	1	3,672	51	84	12,545	400	112,031	10,273	60

Tables 1 and 2 record conditions as of Dec 31 1937	Discrepancies between these figures and those found in the list beginning on page 986 are due to the fact that the list was revised to March 15 1938
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PATHOLOGY DEPARTMENTS

Hospitals having their own clinical laboratories number 4,527. There were 4,384 in 1936. Thirty-five hundred and ninety-two hospitals reported their pathologic service as under the direction of a pathologist, which compares favorably with 3,248 in 1936 and 3,115

Pathology Departments									
	Hospitals Having Clinical Laboratories	M D Directors	Hospitals Sending All Work Out	Number of Hospitals Sending Out					
				Tissues	Parasitology	Serology	Bacteriology	Hematology	Biochemistry
Alabama	63	41	13	39	19	36	18	14	12
Arizona	35	24	22	29	31	27	24	17	22
Arkansas	46	34	5	31	14	19	16	15	16
California	237	199	45	134	83	113	85	53	63
Colorado	67	53	24	40	21	35	25	20	17
Connecticut	34	46	18	21	20	30	21	19	20
Delaware	11	11	0	9	4	5	4	3	2
District of Columbia	26	26	3	7	6	10	8	1	6
Florida	67	49	19	51	24	36	22	14	12
Georgia	58	63	9	36	14	41	26	10	10
Idaho	26	18	10	26	10	19	11	14	10
Illinois	208	202	28	124	60	112	73	60	54
Indiana	97	93	21	30	27	52	34	27	27
Iowa	110	80	21	70	40	60	45	31	25
Kansas	51	61	20	61	21	40	20	11	14
Kentucky	73	48	8	52	20	46	26	19	22
Louisiana	57	48	4	24	10	21	16	13	14
Maine	49	31	9	41	19	23	18	12	14
Maryland	66	60	7	30	17	33	24	17	10
Massachusetts	199	175	27	112	59	131	79	58	54
Michigan	148	126	40	129	58	90	72	50	64
Minnesota	184	98	33	116	70	107	84	64	51
Mississippi	60	37	6	48	9	26	12	7	18
Missouri	92	80	19	57	23	41	27	22	27
Montana	0	24	14	33	14	27	16	12	12
Nebraska	72	61	17	71	30	58	32	21	21
Nevada	8	6	2	10	9	8	7	5	5
New Hampshire	31	26	7	20	11	20	16	11	7
New Jersey	112	122	23	50	29	74	33	21	21
New Mexico	96	29	14	31	10	21	18	13	16
New York	424	387	96	209	129	236	130	96	112
North Carolina	128	90	10	82	27	56	36	15	17
North Dakota	30	24	13	33	11	18	16	11	11
Ohio	186	150	40	94	38	82	44	20	32
Oklahoma	98	62	20	72	20	50	20	18	22
Oregon	40	37	13	34	12	23	10	16	9
Pennsylvania	202	208	46	103	46	96	62	40	40
Rhode Island	19	16	4	8	5	12	4	3	3
South Carolina	48	34	8	33	10	18	11	10	7
South Dakota	43	30	9	37	16	29	17	9	12
Tennessee	79	59	7	51	21	37	20	20	10
Texas	223	147	20	100	63	101	72	36	64
Utah	21	19	4	17	7	14	7	6	9
Vermont	21	19	9	23	12	20	16	8	11
Virginia	92	64	10	52	23	44	27	16	19
Washington	79	60	30	51	26	43	30	23	23
West Virginia	67	51	7	32	10	10	16	12	9
Wisconsin	130	96	57	106	67	110	78	53	63
Wyoming	16	13	6	16	7	10	4	4	6
Totals (1937)	4 527	3 592	933	2 778	1 342	2 416	1 577	1 069	1 161
(1936)	4 384	3 248							

in 1935. In most cases where a pathologist is not in charge, there are competent technicians, with physicians making the diagnosis. A total of 2,778 institutions sent their tissue work to outside pathologists, 1,342 their parasitology, 2,416 serology, 1,577 bacteriology, 1,069 hematology and 1,161 biochemistry.

RADIOLOGY DEPARTMENTS

The question "Does the hospital have its own x-ray department?" was answered in the affirmative by 4,894 hospitals as against 4,733 in 1936 and 4,698 in 1935.

The reports on directors in charge of radiologic services indicate that 4,123 are in charge of radiologists, as compared with 3,775 in 1936 and 3,686 in 1935. All the radiologic work for patients is sent to outside radiologists by 553 institutions.

With this census the Council made its first checkup on facilities for different types of radiologic service in the hospitals and found that 3,843 are equipped for roentgenography, 4,126 for fluoroscopy and 2,039 for roentgenotherapy.

OCCUPANCY IN GENERAL AND OTHER HOSPITALS

The rate of occupancy for all general hospitals was 70 per cent, a rate considerably higher than was recorded for any previous year. The rate of occupancy in general hospitals by states is best told by the accompanying full page map and the list of states underneath it. Those states in which less than 60 per cent of the beds in general hospitals were occupied are Arkansas, Florida, Kentucky, Mississippi, Nevada, Oklahoma, South Dakota and Texas, states which in general have a low ratio of beds to population. This failure to utilize available beds is more likely to be due

X Ray Departments

	Hospitals Having X Ray Departments	Departments Having M D Directors	Hospitals Sending All Work Out	Number of Hospitals Having Apparatus for		
				Roentgenography	Fluorocopy	Roentgenotherapy
Alabama	49	53	6	53	62	27
Arizona	42	32	12	34	37	11
Arkansas	44	33	3	31	30	10
California	206	243	14	273	241	202
Colorado	76	62	16	60	63	24
Connecticut	53	49	20	44	40	20
Delaware	12	12	3	11	11	7
District of Columbia	24	23	3	22	20	17
Florida	71	66	9	36	58	31
Georgia	90	76	7	73	78	33
Idaho	40	20	2	19	30	9
Illinois	262	220	15	218	240	130
Indiana	100	77	10	70	84	46
Iowa	122	97	7	98	102	49
Kansas	38	37	10	72	83	41
Kentucky	81	60	5	50	56	20
Louisiana	59	52	1	43	40	22
Maine	57	39	8	36	39	14
Maryland	57	53	9	52	51	21
Massachusetts	108	177	17	169	160	80
Michigan	187	160	17	162	163	61
Minnesota	106	124	16	139	141	37
Mississippi	60	53	3	43	56	26
Missouri	93	87	17	76	81	44
Montana	43	31	7	30	39	13
Nebraska	50	69	7	67	76	33
Nevada	11	7	1	10	11	4
New Hampshire	37	31	4	29	31	17
New Jersey	120	122	20	102	102	56
New Mexico	42	36	9	26	30	12
New York	400	410	59	378	391	184
North Carolina	127	100	17	94	106	35
North Dakota	40	38	7	24	30	10
Ohio	192	160	31	146	164	81
Oklahoma	102	78	10	77	96	23
Oregon	50	44	3	58	47	16
Pennsylvania	200	200	27	203	241	140
Rhode Island	21	19	3	19	17	10
South Carolina	49	42	6	33	40	18
South Dakota	46	39	7	30	33	21
Tennessee	80	77	7	60	60	30
Texas	261	191	12	103	100	100
Utah	20	22	1	15	21	8
Vermont	24	20	6	19	22	6
Virginia	96	80	6	76	73	42
Washington	90	82	10	71	70	40
West Virginia	67	54	7	45	53	20
Wisconsin	100	110	23	124	111	50
Wyoming	20	17	1	20	20	7
Totals (1937)	4 914	4 123	553	3 843	4 126	2 039
(1936)	4 733	3 775				

to the sparsity of the population or to the fact that many of the people do not choose to go to a hospital when sick. On the other hand, those states in which the general hospitals showed an average occupancy rate above 75 per cent are densely populated and liberally provided with hospital facilities, as for example, the District of Columbia, Louisiana, Michigan, New York and Rhode Island.

The average number of unoccupied beds in all general hospitals was 123,811

The total number of idle beds in all hospitals of all types amounted to an average of 180,112, of these 69,869 were in governmental hospitals and 110,203 in nongovernmental hospitals

OVERCROWDING IN STATE MENTAL HOSPITALS

Following the presentation of facts and figures from superintendents and commissioners of state mental hos-

Overcrowding in State Mental Hospitals

State	Total Mental Hospitals in State	Number of Hospitals Reporting Rated Capacity and Average Census	Number of Hospitals Showing No Excess	Number of Hospitals Showing from 5-15% Overcrowding	15-30% Overcrowding	30-50% Overcrowding	Over 50% Overcrowding	Number of Hospitals Not Reporting Both Rated Capacity and Average Census
Alabama	3	3	1	2				
Arizona	1	1		1				
Arkansas	12	12	1	1				
California	9	9	1	1	4	4		
Colorado	4	4	3			1		
Connecticut	4	4	1		1		1	
Delaware	2	2	1			1		
District of Columbia								
Florida	2	2	2					
Georgia	2	2	1			1		
Idaho	3	3		1	1	1		
Illinois	12	12	9	2	1			
Indiana	9	9		1	1	2		
Iowa	7	6	2	2	2			
Kansas	3	4	3	1				1
Kentucky	4	4			1	1	2	
Louisiana	3	1			1			2
Maine	3	3	2	1				
Maryland	3	4	3	1				1
Massachusetts	17	16	3	4	3	2		1
Michigan	9	9	1	1				
Minnesota	8	8	2	3				
Mississippi	3	2	2					1
Missouri	3	4			3			1
Montana	4							
Nebraska	4	4	1	2		1		
Nevada	1	1						
New Hampshire	2	2	1		1			
New Jersey	3	7		1	3			
New Mexico	2	2	2					
New York	31	25	10	8	10			1
North Carolina	4	3	2	1				1
North Dakota	2	2	2					
Ohio	12	12	3	3	3			
Oklahoma	1	1	1	2	1			
Oregon	3	3	3					
Pennsylvania	12	12	4	3	1	2		
Rhode Island	2	2			1		1	
South Carolina	3	2	1	1				
South Dakota	3	3	1		1			
Tennessee	4	4	1		3			
Texas	2	7	7					1
Utah	2	2	2					
Vermont	3	2	1			1		
Virginia	1	5						
Washington	4	4	1	2	1			
West Virginia	1	4	1	1	1		1	
Wisconsin	1	1		2	1		2	
Wyoming	2	2	1		1			
Totals (1937)	237	237	101	30	54	21	7	10

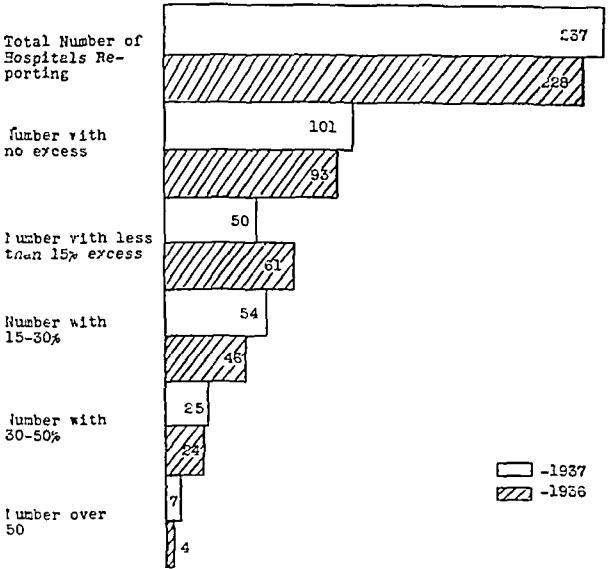
pitals in the Hospital Number last year, a similar inquiry was made by questionnaire addressed to the same officials. The reports received cover 237 institutions—seven more than last year—and these have been tabulated and the results are shown in the accompanying graph and table

The degree of overcrowding was based on the ratio of the number of patients exceeding the rated capacity to the rated capacity. This capacity was determined for the most part either by the original floor plans of the hospital or by state law or health requirements. A number of states endorsed the recommendations of the American Psychiatric Association. The majority of hospitals indicated that 50 square feet or 600 cubic feet was sufficient for each patient in a dormitory, with the same or slightly less for day use. Isolated patients

in single rooms required from 80 to 100 square feet of floor space, or twice as much as the ward patient. The extremes reported as rated capacity vary from the "ideal" of 86 square feet for each dormitory patient in a hospital of limited admissions to the "capacity" obtained by utilization of every foot of available space in all departments.

One hospital, in which floor space is at a premium, records an average of 100 beds with two patients to a bed, a second institution reports fifty beds so used. Another says that patients in several wards are sleeping on mattresses on the floor. Many hospitals, especially in the Southern states, find the distribution of space a serious problem. Besides the division of wards, wings and buildings into quarters for men and women, the segregation of Negro and white patients necessitates four classifications, and difficulty in allotment of space arises. Often the men's wards will be overcrowded, while there are available beds in the other sections of the hospital, and again, the sections for Negroes may be comfortably managed, while those for white patients are overcrowded.

A plea for better working quarters for the staff comes from hospitals where general facilities and the quarters of the staff are utilized of necessity for the care of "continued treatment" patients. Old, unimproved buildings that have served many years form a real handicap in sustaining the efficiency of the employees and the welfare and morale of the patients. The combination of these overcrowded buildings and the poorer facilities they offer cannot compete in general efficiency and actual results with the new buildings that are capable of handling a moderate amount of overcrowding without impairment of service. A superintendent of a hospital that is not considered overcrowded in caring for



Comparison of overcrowding—1936 and 1937

2,500 patients writes "We feel that 300 less (patients) would promote better service." Nevertheless, given a choice, the superintendents and committees on admission voluntarily add more to their burden than is required of them. They feel certain that more benefits can be supplied through limited institutional care than the majority of patients would receive in the community or detention home from which they come.

While nineteen states give statistical evidence of improvement in the facilities of state mental hospitals, and several states have kept the ratio of overcrowding to the hospital capacity a constant, fifteen states show an increasing percentage of overcrowding over 1936. The number of commitments to mental hospitals from the date of the hospital census to the end of the year 1937 indicates a steady increase in patients admitted that outweighs any attempt to extend facilities or to return patients to the community. The number of beds set up and in use Dec 31, 1937, was greater than the average daily census reported in 205 hospitals out of the 237 for which data were available. Of the thirty-two showing a decrease, one had released 300 patients, five

facilities do not cover the treatment of this disease admit no epileptic patients.

Although selective admittance is beneficial to both the patient who receives highly individual care and to the hospital which is not exceeding its capacity, this solution has its difficulty in the ever increasing waiting lists of mentally ill patients, ill adjusted to their community life or to the jail to which they are committed.

Well directed attempts to overcome these serious conditions have been made, with promising results and an ultimate goal in sight. During the year 1937, seven hospitals in five states reported new buildings or additions to the old, caring for 4,320 patients. In general, this resulted in a decrease of from 1 to 20 per cent in

## COMPARISON OF DATA FOR ALL REGISTERED HOSPITALS

State	Hospitals		Beds		Bathrooms		Births		Patients Admitted		Average Census	
	1936	1937	1936	1937	1936	1937	1936	1937	1936	1937	1936	1937
1 Alabama	83	84	11 800	12 843	464	460	6 631	7 704	98 901	112 934	9 696	10 273
2 Arizona	64	62	4 785	4 910	224	236	2 607	3 187	41 883	44 122	3 502	3 442
3 Arkansas	61	57	9 118	11 012	240	230	2 431	3 094	53 933	56 080	7 419	8 830
4 California	361	364	6 310	69 619	3 027	3 289	49 143	57 289	59 090	607 862	57 410	59 403
5 Colorado	103	100	12 876	13 471	383	601	7 371	8 342	90 001	106 590	9 440	10 157
6 Connecticut	80	77	18 090	18 754	1 031	1 022	17 010	18 261	144 536	152 336	11 570	15 631
7 Delaware	11	10	2 691	2 389	116	123	2 009	2 452	17 340	18 841	2 082	2 231
8 District of Columbia	11	10	12 872	13 730	637	647	10 577	11 219	109 379	101 891	11 506	11 861
9 Florida	90	91	9 621	10 746	532	617	7 629	9 173	8 723	97 431	7 433	7 864
10 Georgia	108	108	15 433	16 344	612	669	10 175	12 307	132 446	147 839	12 382	12 982
11 Idaho	46	44	3 338	3 376	247	211	3 717	4 441	37 638	37 064	2 541	2 623
12 Illinois	317	304	73 828	74 433	4 037	4 075	64 602	71 238	609 361	633 470	60 573	61 598
13 Indiana	137	136	23 007	23 712	1 210	1 227	17 178	21 409	178 632	200 039	19 803	20 309
14 Iowa	136	131	19 663	20 469	1 147	1 116	13 399	17 287	152 963	161 775	16 431	16 503
15 Kansas	117	116	14 229	14 760	770	782	9 548	10 934	115 544	127 954	11 110	11 318
16 Kentucky	97	94	11 086	11 014	544	587	6 767	8 090	104 001	114 898	12 218	12 582
17 Louisiana	64	66	14 146	14 947	449	467	11 980	10 691	183 632	145 499	13 063	12 338
18 Maine	66	63	6 096	7 330	431	434	4 490	5 076	52 843	56 530	5 761	6 003
19 Maryland	76	76	18 693	19 039	688	746	11 081	12 330	124 607	134 768	16 036	16 187
20 Massachusetts	236	233	57 718	58 940	3 110	3 004	41 736	43 147	359 598	407 874	49 440	51 031
21 Michigan	236	211	43 757	43 915	2 168	2 227	37 381	43 438	330 160	338 924	26 889	28 373
22 Minnesota	220	217	27 727	28 887	1 331	1 586	23 173	23 640	234 712	248 938	23 418	23 961
23 Mississippi	7	74	8 512	8 870	923	339	3 437	4 019	63 079	74 823	6 102	6 513
24 Missouri	148	141	27 812	29 096	1 518	1 580	10 634	21 632	222 617	279 588	2 812	24 408
25 Montana	58	59	5 342	6 336	430	458	5 574	6 004	53 407	56 013	3 889	5 119
26 Nebraska	97	99	10 219	10 261	623	668	7 599	8 711	80 090	86 094	8 321	8 437
27 Nevada	17	16	971	893	66	70	793	897	8 686	8 594	787	533
28 New Hampshire	43	46	4 012	5 162	333	383	4 243	4 818	28 406	41 111	3 091	4 138
29 New Jersey	164	167	49 926	49 046	2 242	2 199	36 739	39 716	296 381	370 191	33 560	36 413
30 New Mexico	11	14	3 933	4 036	181	203	1 780	2 232	28 702	30 909	2 061	2 733
31 New York	587	573	174 115	171 702	7 793	7 793	131 930	139 990	1 226 069	1 277 311	145 663	133 497
32 North Carolina	111	106	11 394	16 871	818	821	10 296	12 134	136 911	174 692	12 244	13 313
33 North Dakota	52	52	6 010	6 010	408	393	4 879	3 370	49 083	49 016	4 499	4 341
34 Ohio	232	230	53 361	53 831	2 333	2 342	42 064	51 036	399 930	440 600	44 927	43 134
35 Oklahoma	119	123	14 731	14 821	611	634	9 008	10 788	10 096	111 511	12 191	12 130
36 Oregon	70	72	9 963	10 293	313	321	7 013	9 126	87 493	93 931	8 441	8 736
37 Pennsylvania	330	334	81 429	81 433	4 417	4 442	73 162	80 240	638 288	711 711	71 238	72 906
38 Rhode Island	29	27	7 316	7 402	424	441	6 385	6 823	47 341	47 740	6 371	6 612
39 South Carolina	57	59	8 403	9 348	276	341	4 271	5 179	66 407	79 417	6 091	7 614
40 South Dakota	56	56	3 327	4 098	371	387	3 932	4 107	43 722	43 401	4 057	3 701
41 Tennessee	101	97	14 913	14 088	533	73	9 833	10 437	131 231	137 038	11 873	12 497
42 Texas	296	300	31 470	32 612	1 480	1 333	20 073	30 761	319 240	319 240	24 094	23 017
43 Utah	3	32	3 290	3 377	327	234	3 017	6 929	31 162	38 698	2 778	2 017
44 Vermont	22	32	3 500	3 732	178	187	2 319	2 787	28 997	31 479	2 992	3 132
45 Virginia	109	107	18 677	19 760	612	617	8 600	9 212	1 061	146 992	1 677	16 138
46 Washington	115	116	17 249	17 901	958	1 096	12 880	1 694	1 394	1 274	12 894	14 490
47 West Virginia	77	79	9 999	10 102	431	410	4 639	2 890	113 371	129 778	7 112	7 701
48 Wisconsin	221	218	29 933	30 498	1 719	1 745	23 810	21 890	2 392	2 010	24 340	24 997
49 Wyoming	25	26	2 600	2 681	131	131	1 597	1 715	19 185	21 841	2 037	2 102
50 Totals	6 189	6 125	1 096 721	1 124 345	54 275	57 366	891 500	9 9912	8 416 881	9 921 517	50 316	54 416

had made transfers to new mental hospitals, several had patients on furloughs or holiday vacations and twenty-five had adopted the cumulative waiting list the only means by which a stationary or slightly decreasing census can be reached. In those giving a definite number awaiting admittance, the range was from ninety to 300 patients.

In connection with the waiting list, restrictions governing admissions are set up. Clauses in admission rules may keep the number accepted within the rated capacity of the hospital, actual lack of space may restrict admissions for a short time. The most common restrictions are those of age groups and type of case. State schools for the feeble-minded restrict ages within the years 7-16 or 7-25, other institutions refuse all applicants over 70. Several hospitals limit their service to the care of the epileptic, and again hospitals whose

the overcrowded conditions in the individual states. One hospital states that the opening of two dormitories will accommodate all admissions for approximately four years. Fourteen states have made appropriations and plans for twenty hospitals to be constructed within the coming year.

Seven states are looking ahead to adequate service in the future. A progressive building program is under way in Rhode Island that will add 3 000 beds, sufficient to care for all patients until 1941 or 1942. Pennsylvania too is relying on the completion of an extensive building campaign to cut its waiting list. The overcrowding in two of the Illinois hospitals will be remedied by transfers to a modern unit of 6,300 beds. The state of California plans for a future capacity of 6,000 beds in one of its hospitals, new cottages are to be available for patients in another. A small state levy collected over



a period of ten years will benefit a Nebraska institution that is now restricting admissions to keep within its capacity

#### HOSPITALS IN PROCESS OF DEVELOPMENT

Regarding present and future expansion in the hospital field, the direction and amount of hospital building and development can be known only after the completion of a more thorough survey already undertaken by

#### How Hospitals Shared in Patients Admitted

	Number of Patients Admitted		Percentage of Patients Admitted	
	1931	1937	1931	1937
<b>According to Ownership or Control</b>				
Federal	301 149	439 480	4.2	4.8
State	388 984	511 809	5.1	5.6
County	345 236	549 332	4.8	6.0
City	689 209	897 650	9.6	9.7
City-county	108 400	111 610	1.5	1.2
<b>Total governmental</b>	<b>1 833 078</b>	<b>2 509 925</b>	<b>20.6</b>	<b>27.2</b>
Church	2 013 302	2,490 114	28.1	27.1
Fraternals	44 700	32 120	0.6	0.3
Associations and restricted corporations		3 168 917		34.7
Individual and partnership corporations (unrestricted as to profit)	409 184	500 309	6.4	5.5
Industrial	91 166	50 077	1.3	0.5
Independent associations	2,714 406		37.9	
<b>Total nongovernmental</b>	<b>5 322 898</b>	<b>6 711 092</b>	<b>74.4</b>	<b>72.8</b>
<b>According to Type of Service</b>				
General	6 321 861	8 349 773	88.3	90.5
Nervous and mental	97 889	190 624	1.4	2.1
Tuberculosis	80 562	101 839	1.1	1.1
Maternity	91 496	69 949	1.3	0.7
Industrial	93 415	41 028	1.3	0.4
Eye, ear, nose and throat	113 762	95 241	1.6	1.0
Children's	83 416	89 384	1.2	1.0
Orthopedic	37,842	33 015	0.5	0.4
Isolation	40 210	37 295	0.6	0.4
Convalescent and rest	28 628	29 411	0.4	0.3
Hospital departments of institutions	131 791	141 189	1.8	1.6
All other hospitals	30 604	44 069	0.5	0.5

the Council and specifically directed to fields in which hospitals are already being developed and where there is apparent room for expansion. However, data already secured regarding hospital programs indicate that in addition to those found in the Register, and listed by communities in this issue, there are 100 new hospitals actually in operation. Another seventy are under construction. This does not refer to renewals or additions to existing buildings but to new hospitals in new locations. Further, in at least 179 separate communities, hospital programs are definitely under way.

#### Hospitals, Sanatoriums and Related Institutions

	Hospitals	Beds	Baths	Births	Average Admitted	Census
Hospitals and sanatoriums	4 023	947 920	52 818	914 261	8 842 280	790 472
Related institutions	1 200	177 320	2 748	18 601	349 237	103 904
<b>Total registered hospitals</b>	<b>6 123</b>	<b>1 124 548</b>	<b>55 566</b>	<b>932 862</b>	<b>9 221 517</b>	<b>894 436</b>

Much is being done by way of rehabilitation and modernization of old buildings. A very common procedure among hospital building programs is the alteration of existing dormitory space for the installation of laboratories, x-ray departments, and other facilities not contemplated in the original plan of existing hospitals.

#### HOW HOSPITALS SHARED IN PATIENTS ADMITTED

All governmental hospitals, as a group, including federal, state, county, city, and city-county, admitted a total of 2,509,925 patients, or 27.2 per cent of all the patients admitted to hospitals during the year, as com-

pared with 25.6 per cent in 1931. The nongovernmental hospitals admitted 6,711,592, or 72.8 per cent of all hospital patients, as compared with 74.4 in 1931.

Under hospitals according to type of service, the general hospitals ran away with the field by admitting 8,349,773, or 90.5 per cent of all persons hospitalized during the year. The next highest was the nervous and mental institutions, admitting 195,624 persons, or 2.1 per cent.

The greater number of patients cared for in general hospitals is offset somewhat by the longer period of stay in some other types of institutions, especially those for mental and nervous diseases and for tuberculosis. Accompanying tables afford interesting comparisons with respect to the number of patients admitted.

The preponderance of service in general hospitals over that in special hospitals seems to show a trend toward handling the specialties, as well as the general cases, in general hospitals.

#### Hospitals in Process of Development

	Hospitals Opened Registration Pending	New Hospitals Under Construction	Hospitals Planned and Being Developed
Alabama	3	1	4
Arizona		2	1
Arkansas	1	3	3
California	5	2	11
Colorado			3
Connecticut	1	1	1
Delaware		1	
District of Columbia			1
Florida	3	2	8
Georgia	4	2	3
Idaho		2	3
Illinois		1	7
Indiana	1		1
Iowa	2	1	2
Kansas	3	1	6
Kentucky	2	6	3
Louisiana	2	2	2
Maine			1
Maryland	1	1	2
Massachusetts	1		3
Michigan	3	5	9
Minnesota	3	1	2
Mississippi	2	2	5
Missouri		1	0
Montana	2	1	2
Nebraska	2		2
Nevada		1	1
New Hampshire			
New Jersey	3	1	3
New Mexico	4	2	1
New York	6	4	9
North Carolina	2	3	4
North Dakota		1	6
Ohio	5	2	4
Oklahoma	1	1	9
Oregon	5	1	2
Pennsylvania	1	2	4
Rhode Island			
South Carolina		1	5
South Dakota	3	1	3
Tennessee	3		2
Texas	15	9	12
Utah			3
Vermont	1	1	1
Virginia	2	1	1
Washington	6		5
West Virginia	1	1	4
Wisconsin	1		5
Wyoming			1
<b>Totals</b>	<b>100</b>	<b>70</b>	<b>179</b>

#### PERCENTAGE OF BEDS OCCUPIED

The average occupancy rate for all hospitals for the year was 84 per cent—that is, the average daily census showed 16 per cent of all hospital beds idle. General hospitals made an unusual mark by showing 70 per cent occupancy as compared with 67.4 per cent in 1936, 59.9 in 1933 and 65.5 in 1929. Nervous and mental and tuberculosis hospitals, always high, had an average occupancy rate of 95.8 and 84.4 respectively. Isolation

hospitals recorded a rate of 42.6 per cent occupancy, the next higher being industrial hospitals with an average occupancy of 54.6 per cent.

Under hospitals according to ownership or control, it is worth noting that county hospitals declined in their rate of occupancy as did also the city and the city-county hospitals, while church hospitals increased to the heyday of 68.6 as compared with 65.3 for last year.

#### BIRTHS IN HOSPITALS

The number of births in all hospitals, as shown by the census, is 932,912 as compared with 831,500 last year. This gain is greater than that of any previous year. The total number of all births in all hospitals and out, for 1937, has not yet been computed, but the latest report of the United States Bureau of the Census on this subject, that of 1934, gave 2,167,636 live births for that year. The principal gains in number of births were made in general hospitals. Children's hospitals gained slightly. Births in maternity hospitals are on the decrease, having shown for last year a total of 43,449 against 44,510 for 1936.

#### DEATHS IN HOSPITALS

A total of 5,706 registered hospitals and related institutions reported the deaths, giving a grand total of 481,888 for the year.

#### Deaths in Hospitals

State	Hospitals Reporting Deaths	Number of Deaths
Alabama	77	3,387
Arizona	38	2,123
Arkansas	50	2,508
California	322	33,871
Colorado	94	5,799
Connecticut	71	7,114
Delaware	13	1,930
District of Columbia	28	5,100
Florida	87	3,383
Georgia	98	6,222
Idaho	41	1,424
Illinois	280	36,707
Indiana	17	10,823
Iowa	141	7,932
Kansas	109	3,231
Kentucky	83	6,986
Louisiana	6	778
Maine	60	2,763
Maryland	72	7,023
Massachusetts	244	20,663
Michigan	211	19,768
Minnesota	201	11,096
Mississippi	67	3,161
Missouri	138	13,820
Montana	37	2,707
Nebraska	96	3,738
Nevada	1	273
New Hampshire	43	2,041
New Jersey	100	18,898
New Mexico	0	140
New York	520	71,476
North Carolina	148	8,044
North Dakota	30	1,830
Ohio	280	26,034
Oklahoma	110	3,018
Oregon	62	4,834
Pennsylvania	328	39,082
Rhode Island	23	3,111
South Carolina	3	4,935
South Dakota	31	1,867
Tennessee	92	7,931
Texas	281	14,954
Utah	23	1,680
Vermont	70	1,797
Virginia	97	6,934
Washington	110	7,601
West Virginia	73	4,830
Wisconsin	207	11,581
Wyoming	24	635
Total (1937)	5,706	412,000
Total (1936)	4,771	412,200

In 1936, the first year in which the number of deaths was asked, the question was answered by 4,785 institutions and the total deaths reported were 413,202. It is not uncommon to receive a much better response to a question the second year it is asked.

The total number of necropsies performed in all registered hospitals was not ascertained. However, the 732 hospitals that are approved for intern training reported a total of 85,050 necropsies for the year.

#### HOSPITALS REFUSED REGISTRATION

There are 617 institutions which, because of alleged unethical or questionable practices, admission to them

#### Hospitals Refused Registration

State	No. of Hospitals	Beds	Bassinets
Alabama	3	120	13
Arizona	3	61	13
Arkansas	12	263	2
California	74	2,680	33
Colorado	24	483	89
Connecticut	2	50	10
Delaware			
District of Columbia			
Florida	10	510	27
Georgia	2	26	2
Idaho	3	67	10
Illinois	46	1,061	131
Indiana	19	870	47
Iowa	26	678	38
Kansas	30	346	10
Kentucky	14	32	6
Louisiana	6	116	18
Maine	4	76	107
Maryland	18	400	116
Massachusetts	24	606	30
Michigan	10	238	1
Minnesota	2	72	49
Mississippi	21	1,090	16
Missouri	6	106	43
Montana	17	300	
Nebraska	1		
Nevada			
New Hampshire	8	130	20
New Jersey	3	50	12
New Mexico	30	1,000	212
New York	5	181	1
North Carolina	4	71	9
North Dakota	29	733	107
Ohio	21	427	50
Oklahoma	14	345	66
Oregon	24	549	46
Pennsylvania	1	6	3
Rhode Island	2	62	8
South Carolina	4	124	19
South Dakota	10	204	2
Tennessee	26	663	10
Texas	2	93	8
Utah	1	8	
Vermont	21	450	78
Virginia	6	92	8
Washington	13	787	99
West Virginia	4	111	10
Wisconsin			
Wyoming			
Totals (1937)	617	18,624	2,094
(1936)	581	17,110	1,833

staffs of members who are seriously unqualified either morally or professionally, flagrant methods of advertising or for other valid reasons, are deemed unworthy of being included.

These places claim a total capacity of 18,624 beds and 2,094 bassinets—or less than 2 per cent of the capacity of the registered hospitals. There was a small gain in the number and capacity of the hospitals refused registration, as the result of a constantly closer checkup which is possible for the Council to make.

California, which holds the record, has seventy-four unregistered hospitals and had seventy-two last year. Other states that stand high in the number of such institutions that exist within their borders are

Illinois	46
New York	30
Kansas	30
Ohio	29
Missouri	27
Iowa	26
Texas	24
Pennsylvania	24
Michigan	24
Colorado	24

Only hospitals that are registered by the American Medical Association are admitted to the list of the American College of Surgeons or to membership in the American Hospital Association.

## SCHOOLS OF NURSING

In response to the questions as to whether the hospital has a school of nursing and how many students are enrolled, it was revealed that there are 1,399 schools

*Hospitals in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands*

	Hospitals	Beds	Basinsets
Alaska	19	516	61
Canal Zone	10	1 607	51
Guam	2	90	25
Hawaii	46	5 114	2 2
Philippine Islands	108	9 518	613
Puerto Rico	53	5 215	295
Virgin Islands	5	344	31
Totals (1931)	243	22 404	1 582
(1936)	2 0	20 719	1 259
(1935)	233	19 416	1 1 0
(1934)	221	18 430	1 020
(1933)	215	18 794	1 036

of nursing. Last year there were 1,420. These figures include only the schools that are accredited by the state boards of nurse examiners, the accredited standing of

the schools was verified by those boards on Jan 1, 1938. There were 73,153 students enrolled.

The average number of students per school is fifty-two, whereas in 1926 the average enrolment was thirty-six students to the school. In 1932 the average was forty-five and in 1936 it was forty-eight.

## OUTPATIENT DEPARTMENTS

The question whether the hospital maintains an organized outpatient department brought affirmative responses from 2,169 institutions.

In general, the volume of outpatient service tends to fluctuate somewhat with the state of the country's prosperity, since such service was designed largely for people of low income. The increased growth of outpatient service is most noticeable in hospitals in congested centers and in teaching institutions. Some classification of outpatient services that could be generally acceptable is much needed before figures can convey much meaning. Such classification and definition may be accomplished in the future, it is hoped.

## INTERNSHIPS AND RESIDENCIES

One of the most important functions of the Council on Medical Education and Hospitals is the certification of hospitals for the training of interns and resident physicians. This program, which continues with increasing emphasis, has shown progressive development since 1914, when the first list of internships was published designating 603 hospitals as suitable for the instruction of young graduates in the clinical branches of medicine and surgery.

Recurring evaluations have successfully kept pace with the problem of supplying educational facilities for the increasing number of medical graduates who annually seek hospital appointments in preparation for general practice or subsequent postgraduate study in special fields.

The practice of assigning credit to residencies in specialties began in 1927, when 278 hospitals were certified for advanced training. As early as 1914, however, there were ninety-five special hospitals approved in the internship classification. Subsequent developments in the field of specialization attest the wisdom of the Council in establishing beginning standards for certification on an official basis. This program, which has recently culminated in the establishment of special boards in twelve of the divisions of medicine and surgery, will continue to claim the attention of the Council particularly in the matter of certifying hospitals for special training.

## GROWTH OF INTERNSHIPS

In 1914, when the first internship list was published, 603 general hospitals provided positions for 2,667 interns and ninety-five special hospitals accepted 428. Subsequent publications show that 510 hospitals were approved in 1923 with 3,119 internships available and 614 hospitals in 1930 having positions for 5,531 interns. The 1937 list records an increase of approved hospitals to 712 and a further extension of internships to 7,167. Currently there are 732 intern hospitals approved which offer a total of 7,223 available internships. Actually there are only about 5,510 internships available annually according to data compiled in January 1937. This reduction occurs as a result of

the increased length of internships, which averaged approximately 15.6 months last year.

In this connection it is of interest to note the number of medical graduates listed in the table on growth of internships. The number of graduates last year—

## Growth of Internships

	Number of Hospital	Available Internships	Medical Graduates (U S)
1914	603	3 095	3 594
1923	510	3 119	3 120
1930	614	5 531	4 507
1937	712	7 167	5 317

5,377—corresponds quite closely to the number of internships available annually. Other factors, however, enter into the balance between internships and medical graduates, as, for example, the employment of Canadian and foreign graduates and to some extent the additional internships in unapproved hospitals.

## TYPES OF INTERNSHIPS

The Council approves rotating, straight and mixed internships. The rotating type includes assignments in medicine, surgery, obstetrics, pediatrics and the laboratories, while the straight service is limited to one department. A service between these two limits is designated a mixed internship.

The internship of fifth year in medicine is essentially a continuation of the undergraduate instruction along practical lines and is now a requirement for graduation in thirteen medical schools and a requisite for licensure in twenty-one states including Alaska and the territory of Hawaii. Two additional states will apply the internship requirement in 1939. Not only the state boards and medical schools recognize the importance of the internship plan but the young graduates themselves realize the need for continued hospital training. Consequently the internship program has become so firmly established in the field of medical education that over 95 per cent of the graduates continue with one or more years of hospital service.

Reference to the table on length of internships according to type will readily indicate that the rotating plan

is still the predominant choice of hospitals and prospective interns, as evidenced by the fact that 571 hospitals and 5,271 internships come under this classification.

The system is not free from criticism, however, especially when changes of assignments occur at such frequent intervals that little can be accomplished along educational lines. It is to overcome this deficiency in the rotating plan that many services have been lengthened to eighteen or twenty-four months. Largely to accomplish the same purpose, some hospitals eliminate the independent assignments in minor subspecialties and

*Length of Internships according to Type*

Type	Number of Hospitals								No of Interns
	12 Mos	18 Mos	24 Mos	30 Mos	36 Mos	Over 24 Mos	Variable	Total	
Rotating	466	3	2	21	21	67	3	571	5,271
Straight	5						1	15	460
Mixed	91			3	1	6	1	102	601
Combination	7			1	1	1	15	21	835
Total	572	3	2	21	1	71	32	712	7,167

group the entire service into major divisions, which thereby gain correspondingly in time. In large hospitals the short assignments are usually avoided by the creation of parallel services and corresponding divisions in the house staff.

Straight internships offered in fifteen hospitals provide 460 available positions. Practically all are conducted under medical school direction, and, although they represent single departmental services, they may have certain advantages in the continuity of instruction, supervision by a qualified teaching staff, well organized courses of training, affiliation with undergraduate teaching and the maintenance of a scientific medical school atmosphere.

The mixed type occurs in 102 hospitals, which can accommodate 601 interns. Twenty-four hospitals representing 835 internships offered a combination of services, i. e., both rotating and straight, rotating and mixed or straight and mixed. The rotating plan is employed in 80 per cent of the hospitals, the straight service in 2 per cent, the mixed type in 14 per cent and a combination of assignments in 3 per cent.

Of the 712 hospitals approved for intern training, 498 require assignments in the outpatient department, including 419 of the rotating services, eleven of the straight internships, fifty-one in the mixed classification and seventeen of the combined services.

#### LENGTH OF INTERNSHIPS

Of the 712 hospitals approved for intern training 572 offer a service of twelve months duration. Twenty-five hospitals have an eighteen months assignment and seventy-four require twenty-four months. Only a few are listed as fifteen, sixteen or twenty-one months. The thirty-two services classified as variable in the table on length of internships are hospitals in which two assignments of varying lengths are offered for example twelve and eighteen months, twelve and twenty-four months, and so on. In this group there are seven hospitals where one of the services exceeds twenty-four months. Three other hospitals offer services of twenty-seven, twenty-seven and a half and thirty-six months respectively.

These figures indicate that 80 per cent of the hospitals have a one year service and 10 per cent a two

year assignment. In the eighteen months group are 3 per cent of the hospitals and in the variable classification 4.5 per cent. Practically the same ratios are found in the assignments of the rotating and mixed groups alone.

#### NECROPSY PERFORMANCE IN INTERNSHIP HOSPITALS

Necropsy performance in hospitals has rightly become a criterion of the scientific attitude of the staff. It reflects a desire to elevate the practice of medicine, an eagerness for scientific accuracy and a recognition of pathology as a sound basis on which to build clinical knowledge. To interns and older physicians alike there is a steady accrual of knowledge through repeated postmortem studies in which pathologic and clinical manifestations are carefully correlated.

It is essential, however, that all postmortem examinations be carried out by or under the immediate supervision of a pathologist competent to interpret both gross and microscopic pathologic changes and prepare the necessary reports for future reference.

To comply with the requirements of the Council a hospital approved for intern training must maintain a necropsy rate of at least 15 per cent of its deaths in order to supply an adequate amount of teaching material for the instruction of the house staff. Surgical as well as necropsy specimens can be used to advantage in clinical pathologic conferences, which should be conducted weekly or biweekly in accordance with the amount of material available.

The table on necropsy performance in approved hospitals shows comparative data over a period of years from 1926 to 1937. In 1937, 356 hospitals had a rate of from 15 to 29 per cent, 253 from 30 to 49 per cent, seventy-six from 50 to 69 per cent and twenty-seven had 70 per cent or over. It is of interest to note also that 571 rotating internships had an average necropsy rate of 33 per cent, the fifteen straight services 54 per cent, the 102 mixed assignments 31 per cent and the twenty-four combination services 46 per cent.

The high rates obtained in some hospitals should stimulate others to greater effort. A permit for necropsy study should be requested on all hospital deaths, for

*Necropsy Performance in Approved Intern Hospitals*

Percentage	Number of Hospitals				
	1926	1930	1934	1937	Total
1-29	116	4	34	23	177
30-49	15	161	2	27	195
50-69	21	1	1	13	36
70 and above	14	1	28	9	52
Hospital reporting	212	161	64	72	712

every opportunity to investigate postmortem pathologic changes adds to the sum total of medical knowledge.

In 1937 the hospitals approved for intern training performed a total of 81,470 necropsies exclusive of 3,580 on stillbirths. This is an average of 119 per hospital and 12 per intern employed. These figures are based on 231,903 deaths and 15,507 stillbirths and indicate an average necropsy rate of 34.4 per cent for all hospitals on the approved intern list.

#### COMPENSATION FOR INTERNS

Information presented in the table on salaries of interns in approved hospitals furnishes undeniable evidence that financial remuneration is still a minor factor

in the selection of an internship. Especially significant is the high ratio of interns—84.4 per cent in 1937—serving without salary or receiving less than \$25 a month. Only eighty-two hospitals are now paying from \$26 to \$50 and but twenty-one have a higher schedule, of which nineteen are federal hospitals operating according to government pay tables. Few pay salaries in lieu of maintenance.

The bonus plan inaugurated as a reward for satisfactory service or to insure completion of contracts developed rapidly after 1923 but has remained practi-

Salaries of Interns in Approved Hospitals

Allowance per Month	No. of Hospitals			No. of Internships		
	1923	1931	1937	1923	1931	1937
No salary	19	109	182	1,660	2,842	2,893
\$7.50 or less	1,11	278	352	907	1,653	2,051
\$26 to \$50	96	168	82	373	678	400
Over \$50	17	34	21	71	236	107
Salary in lieu of maintenance		3	8		41	71
Salary and bonus		61	73		445	339
Bonus only	5	6	14	24	12	181
Variable	26	10		88	139	
No report	20	5		46	15	
Totals	310	664	712	3,119	6,124	7,167

cally stationary since 1931. Of the 1937 interns 41.8 per cent received no salary, 42.6 per cent \$25 or less, 5.6 per cent from \$26 to \$50, 1.5 per cent over \$50, 1 per cent received salary in lieu of maintenance and 7.5 per cent obtained bonuses.

The practice of granting interns an allowance for incidental expenses is firmly established in many hospitals and is not objectionable. However, any tendency to shift the emphasis from the educational to a financial remuneration is contrary to the best interest of hospital and intern alike.

#### GROWTH OF RESIDENCIES

In 1914 the Council on Medical Education and Hospitals approved ninety-five specialty hospitals as a feature of the internship classification. This method of listing continued thereafter until in 1927 a separate

Growth of Residencies (1927-1932)

Specialty	Number of Resident Physicians*				
	1927	1929	1930	1931	1932
Anesthesia					
Dermatology	19	27	27	27	26
Gynecology and obstetrics	21	17	17	18	18
Medicine	111	134	167	170	182
Neurology	220	254	243	238	266
Neurology	362	377	410	420	437
Ophthalmology	75	110	117	170	113
Otolaryngology	64	45	52	53	52
Pathology	9	78	87	89	90
Pediatrics	14	187	190	205	213
Radiology	49	53	57	61	59
Surgery	262	254	266	287	297
Tuberculosis	159	172	173	190	181
Urology	24	41	47	50	50
Other	111	142	157	164	157
General practice	45	18	18	29	
Totals	1,716	1,909	2,078	2,139	2,141

See following table for years 1934 to 1937

residency classification was established indicating the number of positions available in the various specialties. There has been a steady growth in the residency program as shown in the special tables referring to this subject. The year 1927, with 278 hospitals approved and 1,776 residencies, is practically the average of the increase, which has extended from ninety-five hospitals and 428 available positions in 1914 to 465 hospitals, 1,277 residency programs and 3,328 available residencies

as of March 1938. Reference to the table on hospitals approved for residencies and positions available will illustrate clearly the increase in number of hospitals and residencies from 1927 to 1938.

The table on growth of residencies from 1927 to 1932 shows the number of positions available in the various specialties as then classified. Residencies in general practice were certified until 1932, when credit was extended to all general residencies of a clinical nature in hospitals approved for intern training. Since that time a mixed residency classification has been extended to the general educational service in a few hospitals not on the approved intern list.

#### PRESENT RESIDENCY CLASSIFICATION

In the table on classification of residencies and number of residents, 1934 to 1937, the major headings correspond to the present listing of specialty boards. The

Classification of Residencies and Number of Residents

Specialty	1934		1935		1936		1937	
	Number of Residencies	Positions Available	Number of Residencies	Positions Available	Number of Residencies	Positions Available	Number of Residencies	Positions Available
1 Internal medicine	131	326	154	342	141	378	149	437
a General medicine	12	12	12	12	4	4	4	4
b Cardiology	11	34	12	38	12	44	14	43
c Communicable disease	5	143	64	161	65	150	71	192
d Tuberculosis	10	34	10	34	10	40	11	34
e Malignant diseases	12	3	1	1	1	1	1	1
f Metabolic diseases	11	23	27	50	22	45	7	10
g Mixed residency	86	255	85	250	87	276	94	301
2 Pediatrics	13	25	14	39	16	49	16	54
3 Psychiatry and neurology	90	220	95	255	95	267	94	279
a Neurology	2	7	2	4	2	2	2	2
b Psychiatry	3	6	3	4	3	5	3	2
c Epilepsy								
d Mental deficiencies								
4 Dermatology and syphilology	16	22	15	19	17	24	19	34
5 Obstetrics and gynecology	19	32	19	30	19	3	23	34
a Gynecology	40	79	40	74	40	81	44	91
b Obstetric	30	129	52	141	55	171	65	197
c Obstetrics gynecology								
6 Surgery	142	404	146	438	153	467	164	580
a General surgery	6	9	6	10	7	10	11	25
b Neurosurgery	2	4	3	5	4	6	4	6
c Thoracic surgery	2	2	1	1	1	1	1	1
d Industrial surgery	1	2	2	4	2	5	2	2
e Fractures	1	1	1	1	1	1	1	1
f Plastic surgery	1	1	1	1	1	1	1	1
g Maxillofacial surgery	4	6	6	8	11	31	13	40
h Anesthesia								
7 Orthopedic surgery	44	85	48	104	51	111	51	122
8 Urology	39	88	42	67	41	77	51	88
9 Ophthalmology	33	85	34	88	37	102	43	125
10 Otolaryngology	40	88	38	97	41	121	49	141
a Ophthalmology oto								
laryngology	33	88	37	87	36	70	30	75
11 Pathology	69	110	76	125	90	141	100	167
12 Radiology	44	66	49	76	54	87	61	110
Physical therapy					1	1	2	2
Other	4	4	3	7	2	3		
Total	1,009	2,373	1,067	2,564	1,126	2,840	1,195	2,922

subdivisions are groups of residencies offering training which relates to the major specialty under which they are listed. There may be some question whether fractures should be listed under surgery or orthopedics, mixed residencies under internal medicine or surgery, and so on. However, the plan observes as closely as possible the relationship of the minor specialty to the major department in accordance with the main purpose of the residency. Physical therapy is not considered a subdivision of radiology as its listing may infer. It was listed as a minor division, however, to avoid confusion with the major services corresponding to the specialty boards.

The highest number of residency programs occur in general medicine, pediatrics, psychiatry, general sur-

gery and pathology, which have 149, 94, 94, 164 and 100 respectively. Correspondingly the number of available residencies in these departments are 437, 301, 279, 580 and 167. Gynecology can accommodate thirty-four residents, obstetrics ninety-one and the combined service on obstetrics and gynecology 197. The tuberculosis service approved in seventy-one sanatoriums and hospitals trains 192 residents.

While most of the residencies approved by the Council are hospital appointments of a clinical nature, there are a number connected with medical schools and other teaching centers which are practically on a fellowship basis in that they involve in addition to the clinical assignment a greater amount of basic instruction, research and frequently a thesis for an advanced degree. Present indications are that these residency-fellowships will continue to increase in medical centers and nearby hospitals where affiliations can be arranged. A further study of the fellowships in various hospitals, clinics and medical schools will be made to determine their relationship to the residency program and the certifying plan of specialty boards.

#### LENGTH OF RESIDENCIES

There are 631 distinct residency programs of one year duration, which is 53 per cent of all residencies as compared to 80 per cent of intern hospitals which have

*Length of Residencies According to Specialties—1937*

Specialty	Number of Hospitals									
	Hospitals Approved in Specialty	12 Mos	16 Mos	18 Mos	21 Mos	24 Mos	27 Mos	30 Mos	Over 36 Mos	No Report
1 Internal medicine	149	84				39	1	18	5	2
a General medicine	4	4								
b Cardiology	14	12		1		1				
c Communicable diseases	71	44	1			7		17		2
d Tuberculosis	11	7	1			1		1		1
e Malignant diseases	1	1								
f Metabolic diseases	7	6				1				
g Mixed residency	94	48				25	2	14	5	2
2 Pediatrics	16	7		2				4		1
3 Psychiatry and neurology	94	46								
a Neurology	2	2								
b Psychiatry	1									
c Epilepsy	2									
d Mental deficiencies	19	7		1				4	1	1
4 Dermatology and syphilology	20	12						1	1	1
5 Obstetrics and gynecology	41	2		1						
a Gynecology	63	21		1		1	1	6	1	
b Obstetrics										
c Obstetrics gynecology										
6 Surgery	164					40	3	21	19	2
a General surgery	11	4							4	
b Neurosurgery	4					1				
c Thoracic surgery	1	1								
d Industrial surgery	2	1				1				
e Fractures	1									
f Plastic surgery	1	1								
g Maxillofacial surgery	1									
h Anesthesia	10	8						2		
7 Orthopedic surgery	51	26		3		15		8	1	
8 Urology	51	25		2		12		8	2	2
9 Ophthalmology	43	14	1	3		15		1	6	2
10 Otolaryngology	43	22	1	1	2	14		1	3	5
a Ophthalmology otolaryngology	50	12		1	1	11				
11 Pathology	100	74				15			4	2
12 Radiology	61	21		2		15		17		1
Physical therapy	2	2								
Total	1111	611	4	2	7	25	3	111	7	21

services of twelve months. Similarly in the two year group there are 253 residencies, or 21 per cent, as compared to 10 per cent in the corresponding internship classification. Above the two year level there is one residency of twenty-five, twenty-six and thirty months respectively, six residencies of thirty-four months, 191 of thirty-six months and fifty-seven over three years.

These figures apply to the residency classification as of Sept 1, 1937, and therefore do not take into account many of the recent changes which seem to indicate that a number of residencies are being lengthened to two or three years to meet the requirements of certifying boards.

#### SALARIES OF RESIDENT PHYSICIANS

Three statistical tables are presented with reference to salaries of resident physicians in the 438 hospitals approved for residencies in specialties. These show the

*Salaries of Resident Physicians—1937*  
(Monthly Allowance According to Specialties)

Specialty	Hospitals Approved in Specialty	Hospitals Offering Salaries			Positions Available
		No of Hospitals	Beginning Salary	Average Beginning Salary	
1 Internal medicine	149	126	\$10-\$125	\$61.00	4
a General medicine	4	4	\$31-\$50	\$41.00	4
b Cardiology	14	14	\$25-\$110	\$100.00	41
c Communicable diseases	71	66	\$10-\$205	\$106.00	119
d Tuberculosis	11	10	\$10-\$100	\$50.00	4
e Malignant disease	1	1	\$100	\$100.00	1
f Metabolic diseases	7	7	\$50-\$80	\$60.00	10
g Mixed residency	94	75	\$10-\$110	\$60.00	301
2 Pediatrics	16	12	\$10-\$50	\$40.00	4
3 Psychiatry and neurology	94	84	\$7-\$167	\$66.00	219
a Neurology	2	2	\$150	\$150.00	2
b Psychiatry	1	1	\$10	\$10.00	2
c Epilepsy					
d Mental deficiencies	19	12	\$10-\$100	\$50.00	4
4 Dermatology and syphilology	20	13	\$10-\$100	\$50.00	34
5 Obstetrics and gynecology	41	31	\$10-\$125	\$60.00	91
a Gynecology	63	46	\$75-\$110	\$67.00	197
b Obstetrics					
c Obstetrics gynecology					
6 Surgery	164	143	\$10-\$150	\$82.00	380
a General surgery	11	9	\$75-\$125	\$90.00	75
b Neurosurgery	4	4	\$50-\$145	\$90.00	6
c Thoracic surgery	1	1	\$50	\$50.00	1
d Industrial surgery	2	2	\$50-\$53	\$66.00	3
e Fractures	1	1	\$15	\$15.00	1
f Plastic surgery	1	1	\$101	\$101.00	40
g Maxillofacial surgery	13	11	\$75-\$101	\$63.00	41
h Anesthesia	51	43	\$10-\$150	\$77.00	122
7 Orthopedic surgery	51	36	\$10-\$125	\$67.00	85
8 Urology	43	24	\$10-\$110	\$60.00	125
9 Ophthalmology	43	27	\$10-\$110	\$60.00	141
10 Otolaryngology	50	21	\$10-\$100	\$67.00	100
a Ophthalmology otolaryngology	100	73	\$10-\$125	\$67.00	167
11 Pathology	61	45	\$10-\$110	\$60.00	110
12 Radiology	2	2	\$75-\$80	\$77.00	2
Physical therapy					
Total	1190	1000			3977

monthly allowances for residents according to specialties, the variation in beginning salaries, average per month, the number of residencies at various salary levels and a comparative salary schedule for residents and interns showing the number and percentages in each salary group.

Certain interesting features will be pointed out. First of all, the emphasis still continues on the educational side even though the residents' salaries average considerably higher than the interns' allowance. Approximately 18 per cent of the residents serve without salary, 25 per cent at \$25 or less, 25 per cent at \$26 to \$50 per month and 25 per cent at salaries over \$50. Only a few receive salaries in lieu of maintenance. The bonus plan is not employed as in the case of intern hospitals. Seventeen of the residency programs are subsidized in part by medical schools. While only 15 per cent of the interns receive over \$50 a month, 25 per cent of the residents receive salaries in excess of that amount. Forty-seven residency programs pay \$126 to \$150 a month, seven from \$151 to \$175 and two over \$175. The high salaries are usually paid where the employ-

ment feature is more prominent as in hospitals for mental diseases, epilepsy, mental deficiencies and tuberculosis. A high average is also observed in thoracic surgery and the residencies in communicable diseases.

#### EVALUATION OF INTERNSHIPS

For the information of hospitals interested in educational activities, a description will be made of the procedure involved in the approval of hospitals for intern training. Ordinarily the process begins with a letter of inquiry from a hospital seeking internship approval or information pertaining thereto. The hospital is immediately sent a copy of the "Essentials in a Hospital Approved for Training Interns" and is instructed to request application blanks if it considers itself capable of conducting an educational service in accordance with the minimum requirements of the Council.

#### PRELIMINARY SURVEY

The application blank, which serves mainly as a preliminary investigation of the educational facilities, requests information of the following type:

1 General Information. This has reference mainly to the number of interns required, length of service, prerequisites for appointment, time of appointment, beginning of service, salary and other compensation.

2 Medical Staff. The hospital is requested to submit the names of the president of the staff and chairman of the intern committee, a classified list of all physicians who use the hospital service and a copy of the staff constitution and by-laws. Information is also requested regarding the types of staff conferences held.

3 Laboratory and Pathologic Service. Questions are asked regarding the pathologist in charge, how much time he devotes to the laboratory service and the duties of the interns in this department.

4 Radiologic Service. Similar information is requested regarding the radiologic division.

5 Medical Library. Reference is made to the location of the library, type of supervision, method of maintenance, number of books and a list of the journals received regularly.

6 Records. Method of organization and supervision is inquired into and the duties of the interns with respect to the clinical charts.

7 Clinical Material. The hospital is requested to list the number of free, part pay and full pay patients, outpatient clinics and visits, and detailed statistical information by services as regards number of beds, admissions or discharges, ward cases, hospital days or average daily census, deaths, necropsies and the length of the intern service in each department.

8 Intern Service. Information is sought regarding the required activities of the interns and other special teaching projects. Intern schedules and rules and regulations are also requested and the names and school of graduation of all interns and residents on duty. A copy of the most recent annual report is also desired.

#### REVIEW OF APPLICATION BLANK

On receipt of the application blank the information is carefully studied with particular reference to the medical staff organization, the qualifications of the pathologist and roentgenologist, medical library facilities, necropsy percentage, number of interns and training schedule. A detailed analysis is made of the staff to determine the extent to which the hospital complies with the following resolution of the House of Delegates:

*Resolved* That it is the opinion of the House of Delegates of the American Medical Association that physicians on the staffs of hospitals approved for intern training by the Council on Medical Education and Hospitals should be limited to members in good standing of their local county medical societies and that the House of Delegates requests the Council on Medical Education and Hospitals to take this under advisement.

If it is obvious that the hospital cannot qualify for intern approval, a letter is sent pointing out the existing deficiencies in the educational service and requesting that the application be resubmitted when the necessary improvements have been made. On the other hand, if the hospital shows reasonable compliance with the Essentials of the Council it is notified that a visit of inspection will be made by a member of the Council's staff at the earliest opportunity. A delay of five or six months may occur, however, because of previous commitments with reference to other applications or re-inspections of hospitals already approved.

#### INSPECTION PROCEDURE

When the survey is arranged, the hospital is notified a week or ten days in advance of the inspector's arrival and is requested to make arrangements for interviews and to have up-to-date information available on the various subjects referred to in the application blank. The inspection itself covers the following features:

1 Interviews. Interviews relative to the educational program are held with the hospital superintendent, chief of staff, chairman of intern committee, department heads, resident physicians and interns. These informal conferences are held at the convenience of the physicians and are not permitted to interfere with the care of patients.

2 General Survey. Usually in company with the hospital superintendent, a survey of the physical plant is made with

#### *Hospitals Approved for Residencies and Positions Available*

	Hospitals Approved	Positions Available
1927	278	1,776
1929	318	1,909
1930	338	2,028
1931	367	2,139
1932	356	2,141
1934	377	2,376
1935	392	2,464
1936	410	2,640
1937	438	2,902
1938	465	3,328

particular reference to the general condition of the building, distribution of beds and services, facilities for obstetrics, surgery, anesthesia, sterilization of dressings and supplies, emergency work, outpatient clinics, pharmacy, x-ray and laboratory departments, record service, dietetic service, and so on. Living conditions for interns and recreational facilities are also investigated.

3 Medical Staff. A thorough study is made of the medical staff organization, methods of appointment, county medical society affiliation, classification of the staff, departmentalization and chiefs of services, method of staff rotation, organization and duties of committees, staff attendance on wards, supervision of interns, teaching activities and staff meetings.

4 Special Personnel. Information is obtained with reference to graduate, student and affiliate nurses, x-ray and laboratory technicians, dietitians, pharmacists, record librarians, social service workers, physical therapists, anesthetists and so on.

5 Department of Pathology. An investigation is made of the facilities and equipment of the department, the scope of service, facilities for necropsy studies, regulations pertaining to surgical tissues, department records, reports on tissues and necropsies. The pathologist is interviewed relative to his duties, time devoted to the laboratory department, qualifications of the laboratory personnel, duties of interns with respect to laboratory procedures and postmortem examinations and frequency of clinical pathologic conferences.

6 Department of Radiology. After viewing the facilities, equipment and records of the department information is obtained from the radiologist relative to the qualifications of the department personnel, duties of the radiologist and time spent in hospital, the scope of service, type of reports, conferences and instruction of the house staff.

7 Medical Library. The study of the medical library has reference mainly to the availability and usefulness of reference



material, the number of current books and journals, type of supervision, funds for library purposes, extent of reading by interns, library assignments and journal clubs

8 Records The inspection of the record department involves a study of the organization, staff supervision, duties of record committee and qualifications of the record personnel. The details of filing and indexing are gone into to ascertain their relationship to present day standards. Monthly and annual reports are checked for completeness of statistical data relative to the various hospital departments. Numerous charts are examined in the record room and at nurses stations to study the completeness of the clinical data, special reports of opera-

Salaries of Interns and Residents—1937

Monthly Salary	Interns		Residents	
	Number	Percentage	Number	Percentage
No salary	2995	41.8	68	17.7
\$25 or less	3031	42.6	780	24.4
\$26 to \$50	400	5.6	812	24.4
Over \$50	107	1.5	797	24.9
In lieu of maintenance	71	1.0	14	0.4
Bonus	340	7.3		
By medical school and hospital			16	2.4
No report			133	4.8
Total	7167	100.0	3702	100.0

tions, consultations, x-ray, laboratory and tissue studies, the record work of interns and degree of staff supervision. The use of medical records is inquired into and minutes of staff meetings and conferences are perused.

9 Teaching Material A search of the statistical reports is made to determine the adequacy of the teaching material available for intern instruction in the various departments. Of particular interest are the admissions by services, private and ward, the average daily census, number of deaths and necropsies and outpatient visits by clinics. The current census is also studied with reference to intern assignments.

10 Educational Service The study of the educational service involves, first of all, a review of the activities of the intern committee and a survey of the credentials of the present house staff, method of appointment contracts, physical examination and the rules and regulations for interns. The plan of intern instruction is studied thoroughly with reference to assignments, method and frequency of rotation, balance of services, staff supervision, initial instruction, ward teaching opportunities for practical experience in obstetrics, minor surgery, surgical dressings, routine diagnostic and therapeutic procedures and nursing technique. Each departmental service is also reviewed to ascertain the amount of teaching material, staff supervision opportunities for learning, amount of instruction and special conferences.

11 Length of Inspections While the length of inspections varies considerably in accordance with the size of the hospital, availability of information, number of interviews, extent of the educational service and many other factors, it is usually possible to complete the survey of a small intern hospital in four or five hours. In the average hospital the inspection will require a full day and in large hospitals with a number of residencies in addition to the internships it may require two days or more.

ACTION OF THE COUNCIL

Following the survey, a comprehensive report is prepared describing the educational facilities as outlined in the inspection procedure. A copy of the report is sent to the hospital with a summary of deficiencies, if any, and suggestions for the further improvement of the educational service. The application of the hospital and the inspection report are then reviewed at the first session of the Council for official action. If approval cannot be granted at that time, the hospital is advised of the procedure necessary to meet the requirements of the Council and is requested to reapply when the Essentials are fully observed.

If approval is granted the hospital is notified of the action of the Council and is carried in the official lists of the Association. Continued approval is thereafter

based on information supplied regularly by the hospital and periodic inspections by members of the Council's staff.

EVALUATION OF RESIDENCIES

The procedure involved in the approval of residencies in specialties is practically identical with the method of internship evaluation. The application blank is similar in that it requests information on administrative details of the service, staff organization of the department requesting approval, qualifications of physicians instructing residents, staff meetings and conferences, laboratory and pathologic service, radiologic department, medical library, size of department offering residency, number of admissions, deaths, necropsies and outpatients. A description of the duties of the resident is requested, rules and regulations governing the service, names of residents employed and a complete list of all physicians using the hospital.

No marked deviation occurs in the inspection procedure except that additional emphasis is placed on the study of the residency *per se*. As in the case of the intern hospitals, an announcement letter is sent well in advance of the inspector's arrival. Interviews are held with the superintendent, chief of staff, chairman of educational committee, pathologist, radiologist, the chief of the department requesting residency approval and resident physicians on duty.

First a general survey is made of the hospital according to the plan described under evaluation of internships. In addition, a detailed study is made of the residency program with particular reference to the following items:

- 1 General Details Prerequisites for appointment, beginning of residency, length of service, salary, present residents and previous training.
- 2 Staff Coverage Qualifications of chief of service and other staff physicians in department, contact of residents with staff, degree of supervision.
- 3 Teaching Material Admissions to service, average census, outpatients and clinic visits, deaths on service and necropsies, list of operations or special procedures depending on type of residency investigated.

Salaries in Residents in Approved Hospitals—1937\*

Beginning Salary per Month	Number of Residents	Positions Available
No salary	164	68
\$25 or less	236	150
\$26 to \$50	333	51
\$51 to \$75	91	112
\$76 to \$100	163	51
\$101 to \$125	46	147
\$126 to \$150	47	170
\$151 to \$175	7	31
Over \$175	2	3
Salary by medical school and hospital	17	16
Salary in lieu of maintenance	5	14
No report	36	133
Total	1119	997

\* As hospital approved for residence in pediatrics

4 Adequacy of Equipment Detailed study of equipment and scope of service according to type of residency.

5 Teaching Program

(a) Regular Assignments Schedule of duties, assignments to admitting service, outpatient department, diagnostic and therapeutic procedures, follow up service, opportunities for practical experience.

(b) Special Assignments Instruction in basic sciences pertaining to specialty, conferences, research, record duties, teaching of undergraduates, interns and nurses by resident.

6 Coordinate Experience in Allied Fields For example newborn service, behavior clinics and contagion in connection with residency in pediatrics.

7 Adequacy of Reference Material in Specialty

8 University Affiliations, if any, and Possibility for Advanced Degree

## REPORT ON SURVEY OF OCCUPATIONAL THERAPY SCHOOLS

Council on Medical Education and Hospitals of  
the American Medical Association

The president of the American Occupational Therapy Association, Dr Joseph C Doane, on March 10, 1931, transmitted on behalf of the board of managers a request to the American Medical Association that the Council on Physical Therapy undertake the inspection of schools of occupational therapy

The following resolution, presented by Dr J Guiney Taylor of Wisconsin, was passed by the House of Delegates at the Milwaukee session of the American Medical Association, in June 1933

WHEREAS, There is a recognized demand for qualified professionally trained occupational therapists in the hospitals of this country, and

WHEREAS, The work of these therapists is under the direction of members of the medical profession, and

WHEREAS, The medical profession and the American Occupational Therapy Association recognize the vital importance of establishing minimum standards of training and the inspection of training schools in occupational therapy by a qualified and authoritative organization, therefore be it

*Resolved* That the entire subject be left to the Board of Trustees of the American Medical Association, with the request that it be given careful study and consideration and, if practical and feasible, some plan for the establishment of standards, ratings and inspections of training schools in occupational therapy be effected, providing that the expense of such inspection be borne by the school requesting the same

Concerning this resolution, the Board of Trustees recommended that it be referred to the Council on Physical Therapy and the Council on Medical Education and Hospitals for consideration and investigation. It was decided that the Council on Medical Education and Hospitals was the proper body to undertake such inspections, because of its experience in all phases of medical education, including the investigation of medical schools, teaching hospitals, and schools for the training of technicians in specialties that are closely allied to medical service

The inspection work, which began on Nov 27, 1933, was carried out in conjunction with the other activities of the Council, the schools being inspected by members of the staff on their regular tours of hospital inspection. Thirteen schools were visited. Ten, including one Canadian school, were found to be in active operation.

Because any standards adopted must necessarily have the support of those who are engaged most actively in the maintenance of high ideals in the practice of occupational therapy following the completion of the inspections, joint meetings were held with representatives of the American Occupational Therapy Association, the Council on Physical Therapy and the Council on Medical Education and Hospitals, on Dec 29, 1934, and March 20, 1935. According to deductions made from the study of schools and the experience of those taking part in the meetings, a new minimum standard was proposed. On Feb 17, 1935, the new standard was adopted by the Council and at the Atlantic City session of the American Medical Association, in June 1935, it was ratified by the House of Delegates.

The "Essentials of an Acceptable School of Occupational Therapy" were published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, May 4, 1935, Aug 31, 1935, and Aug 29, 1936.

The two and one-half year period following the adoption of the original standards permitted further

study of the schools, as well as the practicability and applicability of the "Essentials." Proposals were made for clarification of meaning of certain requirements, and alterations in the curriculum were suggested. Another meeting was called for Dec 6, 1937, for discussion of revisions to be made in the "Essentials of an Acceptable School of Occupational Therapy." In addition to general rearrangement and rewording, a section on clinical affiliations was added, subjects and hours under curriculum were given further interpretation, and a clause was inserted permitting the concentration of technical training in one field. These alterations were passed by the Council at its meeting in Chicago, Feb 12-13, 1938, and the revised "Essentials" follow the list of approved schools in this article.

The following schools substantially conforming to the minimum requirements adopted by the American Medical Association are approved by the Council on Medical Education and Hospitals

### APPROVED SCHOOLS OF OCCUPATIONAL THERAPY

**Boston School of Occupational Therapy** Boston—Organized in 1918 as a war time measure. Incorporated in 1921 as a nonprofit institution. Control is under a board of thirty-four trustees. The faculty is composed of thirty-six regular members, thirty-eight lecturers and ten extramural instructors, eighty-four in all. The educational requirement is one year of college or equivalent. The duration is three academic years. A total of ten hospitals are used in practice training. The tuition fee is \$300 per year. Thirty students are admitted each year. The next session begins Sept 19, 1938. The Director is Mrs John A Greene.

**Kalamazoo State Hospital School of Occupational Therapy** \* Kalamazoo, Mich.—Organized in 1922. Hospital is oldest and largest institution of its kind in the state. School governed by a joint managing committee of Kalamazoo State Hospital and Western State Teachers College, Kalamazoo. Affiliated with Western State Teachers College in 1936. The faculty includes nineteen instructors at the hospital and seven at the college, lecturers number six and extramural instructors four, a total of thirty-six in all. Two courses are offered: the diploma course of twenty-seven months requiring for admission one year of college or equivalent and a five-year course requiring graduation from an accredited high school and leading to a B.S. degree from Western State Teachers College, the first two years being spent at the college. Those matriculating in the degree course who have had work in an accredited college will be given advanced standing according to the credits acceptable to Western State Teachers College. The school of occupational therapy is affiliated for practice training with three hospitals including the University Hospital at Ann Arbor. No tuition fee is charged for the diploma course; miscellaneous expenses amount to about \$200. For the degree course the student pays the regular college fee for courses taken at Western State Teachers College. Eight students are admitted each year. The next occupational therapy class begins in August 1938. The Director of the school is Miss Marion R Spear, B.S., O.T. Reg.

**St Louis School of Occupational and Recreational Therapy** St Louis—Organized in 1918 as a war time measure. Conducted by the Missouri Association for Occupational Therapy and governed by a board of fourteen trustees. Affiliated with Washington University School of Medicine and University College. The faculty includes a total of thirty-four lecturers, regular instructors and extramural instructors. Two courses are offered: the diploma course of three academic years requiring for admission two years of college or equivalent and a five-year course requiring graduation from an accredited high school and leading to a B.S. degree from Washington University. Practice training is given in a total of ten affiliated hospitals and other institutions. The tuition fee is \$275 per year. Approximately twelve students are admitted each year. The next session begins Sept 28, 1938. The Director is Miss Geraldine R Iermit, Ph.D., O.T. Reg.

**Philadelphia School of Occupational Therapy** Philadelphia—Organized in 1918. Incorporated in 1923 as a nonprofit organization. Management is vested in a board of directors. Partial affiliation exists with the University of Pennsylvania. The faculty includes nine instructors in therapeutic occupations, thirty-three in theoretical subjects and fifteen extramural instructors, a total of fifty-seven. The entrance requirement is one year of post-high school education, college or equivalent. The course covers three academic years or twenty-eight months. Practice training is given in a total of fifteen affiliated hospitals including the Graduate Hospital of the University of Pennsylvania. The tuition fee is \$650. Thirty students are admitted each year. The next session begins Sept 14, 1938. The Director is Miss Helen S Willard, B.A., O.T. Reg.

**Milwaukee Downer College Department of Occupational Therapy** Milwaukee—Course in occupational therapy organized in 1913. Management of the college is vested in a board of thirty-two trustees. The department's faculty includes fourteen instructors at the college, eight lecturers and eight extramural instructors, thirty in all. Two courses are offered: the diploma course of three academic years requiring for admission

\* Tentatively approved

one year of college or equivalent, and a five year course requiring graduation from an accredited high school and leading to a B.S. degree. Practice training is given in eight affiliated hospitals and other institutions. The annual tuition fee for the diploma course is \$250 and for the degree course \$230. Approximately fifteen students are admitted each year. The next session begins Sept. 19, 1938. The Director is Miss Marjorie Taylor O.T. Reg.

**University of Toronto Department of University Extension Toronto Ontario Canada**—Course in occupational therapy organized in 1926. The regular occupational therapy faculty numbers twenty-seven, including instructors, lecturers and demonstrators and in addition there are twenty-three extramural instructors, a total of fifty. The admission requirement is one year of college. The duration of the course is three academic years or twenty-eight months. No pupils and other institutions affiliated for practice training total twenty-two. The tuition fee is \$150 per year. Twenty students are admitted each year. The next session begins the 1st week in September 1938. The Supervisor of the course is Miss Helen P. LeVesconte.

## ESSENTIALS OF AN ACCEPTABLE SCHOOL OF OCCUPATIONAL THERAPY

### I Organization

1 A school of occupational therapy should be incorporated under the laws regulating associations operated not for profit. The control should be vested in a board of trustees composed of public spirited men or women having no financial interest in the operation of the school. The trustees should serve for fairly long and overlapping terms. If the choice of trustees is vested in any other body than the board itself, this fact should be clearly stated. Officers and faculty of the school should be appointed by the board.

2 Affiliation with a college, university or medical school is highly desirable but is not an absolute requirement.

3 Schools of occupational therapy should not be operated by hospitals independently. It is understood, however, that hospitals are needed for practice training in the several branches of occupational therapy as required under clinical affiliations.

### II Resources

Experience has shown that an adequate school of occupational therapy cannot be maintained solely by the income from students' fees. No occupational therapy school, therefore, should expect to secure approval which does not have a substantial additional income.

### III Faculty

The school should have a competent teaching staff, graded and organized by departments. Appointments should be based on thorough education and training and successful teaching experience. The staff should include not less than one regular salaried instructor and one registered occupational therapist. The question of full time and part time appointments is not as important as the qualifications of the instructors, who should be specialists or exceptionally well trained in the lines they are teaching.

### IV Plant

1 The school should own, or enjoy the use of, buildings sufficient in size to provide adequate lecture rooms, class laboratories and administration offices. Equipment should be adequate for efficient teaching in the various departments.

2 A library containing standard texts and leading periodicals in occupational therapy should be provided.

### V Administration

1 **SUPERVISION**—There should be careful and intelligent supervision of the entire school by the dean, director or other executive officer who, by training and experience is fitted to interpret the prevailing standards and who is clothed with sufficient authority to carry them into effect.

2 **RECORDS**—There should be a good system of records showing conveniently and in detail the credentials, attendance grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work. Schools should require that students be in actual attendance within the first week of each annual session and thereafter. Except for good cause no credit should be given for any course when attendance has been less than 80 per cent.

3 **CREDENTIALS**—The admission of students to the occupational therapy school must be in the hands of a responsible

committee or examiner, whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be obtained and kept on file. When the occupational therapy school is an integral part of the university, this work usually devolves on the examiner or registrar.

4 **ADVANCED STANDING**—At the discretion of the administration, advanced standing may be granted for work (or experience) required in the occupational therapy curriculum which has been done in other accredited institutions. Official verification of previous work (or experience) should be obtained by direct correspondence. Preliminary qualifications should also be verified and recorded.

5 **NUMBER OF STUDENTS**—The number of students admitted to the training course should not be excessive. In practical work of a laboratory nature the number of students that can be adequately supervised by a single instructor is, in general, experience, about fifteen; in lectures the number may be much larger. A close personal contact between students and members of the teaching staff is essential.

6 **DISCIPLINE**—All training schools reserve the right to drop a student at any time for any cause which the school authorities deem sufficient.

7 **PUBLICATIONS**—The school should issue, at least biennially, a bulletin setting forth the character of the work which it offers. Such an announcement should contain a list of the members of the faculty with their respective qualifications.

### VI Clinical Affiliations

1 No student should be eligible for entrance into clinical training until she has satisfactorily completed at least one academic year, equal to thirty semester credits, fifteen of which should be in biological science, social science, theory of occupational therapy and clinical subjects and fifteen in therapeutic occupations.

2 Hospitals or institutions affording for clinical training should be carefully judged by the board of directors of the school concerned and be acceptable to the Council on Medical Education and Hospitals and should not be considered eligible for training of students unless the director of the occupational therapy department is a competent occupational therapist qualified to handle students.

3 The occupational therapy director of each training department should be considered a member of a special committee on the training school staff and at all times be in close contact with the director of the school.

4 A well defined program of lectures, clinics and staff meetings should be offered by the hospital to each group of students.

5 **WRITTEN RECORDS, CASE STUDIES AND EXAMINATIONS** should be required of each student. Students should obtain satisfactory rating in clinical training before a diploma is granted.

6 **UNIFORM WRITTEN RECORDS**, specially covering the student's personal adjustment as well as general ability should be kept by the occupational therapy director of each department, regular copy of which should be sent to the school at frequent intervals and all reports filed in the individual student's record at the school.

### VII Prerequisites for Admission

1 **AGE**—The admission of candidates should be governed by the fact that it is required that each student be not less than 21 years of age at graduation.

2 **EDUCATION**—All candidates must furnish proof of having completed a high school education or its equivalent. Equivalent of high school should be adjudged and recorded by the admissions committee of the school. In addition all candidates except those for the degree course must have had at least one year and preferably two years of further accredited education or successful professional training or experience.

Candidates for admission to a training course in a college or university which is combined with work leading to a bachelor degree should be required to comply with the regular entrance requirements of the institution concerned.

3 **CHARACTER**—All candidates should be required to present evidence of good character and general fitness, the evidence of which should be investigated and duly weighed by the school concerned.

4 HEALTH—All students should be given a medical examination under the supervision of the school as soon as practicable after admission, and this examination should be repeated annually. The first examination, at least, should include a tuberculin test followed by a roentgen examination of the chest when indicated.

### VIII Curriculum

1 LENGTH OF COURSE—The minimum length of the course should be twenty-five calendar months (100 weeks) of full time training. The course should include not less than sixteen months (sixty-four weeks) of theoretical and technical instruction and not less than nine months (thirty-six weeks) of hospital practice-training under competent supervision, all as set forth in detail in succeeding sections.

2 DISTRIBUTION OF TIME—The two years devoted to theoretical and technical training should include not less than sixty semester hours, of which not less than thirty semester hours should consist of didactic instruction and not less than twenty-five hours of technical instruction in therapeutic occupations.

(a) Theoretical. The hours devoted to theoretical training should be still further subdivided as follows:

	Semester Hours
(1) Biologic Sciences to include	
Anatomy	15
Kinesiology	
Neurology	
Physiology	
Psychiatry	
Psychology	
(2) Social Sciences to include	
Sociology	4
Delinquency and Crime	
Social and Educational Agencies	
(3) Theory of Occupational Therapy to include	
Interpretative courses covering the principles and practice of occupational therapy in relation to orthopedics, pediatrics, tuberculosis, psychiatry, general medicine and surgery and other special fields	4
(4) Clinical Subjects to include	
Blindness and Deafness	4
Cardiac Diseases	
Communicable Diseases (including Bacteriology if this subject is not given elsewhere)	
General Medical and Surgical Conditions	
Orthopedics	
Tuberculosis	
(5) Electives	3
Total	30

(b) Technical. Because of the increasing demands of the medical profession for qualified therapists trained in special fields applicable to the education and training of disabled persons as well as to the treatment of the sick, there must be a certain amount of flexibility in technical requirements.

Concentration may be in the field of *Therapeutic Arts and Crafts*, in some branch of *Educational Therapy*, or in *Recreational Therapy*.

A minimum of thirty semester hours should be devoted to technical training. The major portion may be allotted to concentration in one field and, in this case, survey courses should be given in the other fields.

- (1) The Field of Therapeutic Arts and Crafts to include
  - Design
  - Leather
  - Metal
  - Plastic Arts
  - Textiles
  - Wood
- (2) The Field of Educational Therapy to include
  - Adult Education
  - Home and Applied Arts
  - Home Economics
  - Hospital Library Management
  - Primary and Secondary Education
- (3) The Field of Recreational Therapy to include
  - Dramatics
  - Gardening
  - Music
  - Physical Education
  - Social Recreation

Advanced standing may be given to students already qualified in one or more branches of the three fields. Such persons may then be given survey courses in the other fields of concentration, and practice in the application of their specialty to the treatment of disabled persons.

(c) Clinical Affiliations. The time devoted to hospital practice-training shall be not less than nine months spent in the following types of hospitals:

Mental hospitals	Not less than two months
Tuberculosis sanatoriums or services	Not less than one month
General hospitals	Not less than one month
Children's hospitals or services	Not less than one month
Orthopedic hospitals or services	Not less than one month

The remaining three months optional.

The Council acknowledges the splendid cooperation extended by the various schools included in the study and also the help of the officers and Educational Committee of the American Occupational Therapy Association. The Council will continue actively in the promulgation of high standards for schools of occupational therapy. Periodic reexamination of the approved schools will be made and revisions of the list will be published as indicated.

### APPROVED SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS

The "Essentials of an Acceptable School for Physical Therapy Technicians," promulgated by the Council on Medical Education and Hospitals, were adopted following a survey of opportunities for such training in the United States, made from 1933 to 1936. The House of Delegates of the American Medical Association passed on the standards proposed at the Kansas City session, May 9, 1936. Approved schools for physical therapy technicians were first listed in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, Aug. 29, 1936.

The American Congress of Physical Therapy and the American Physiotherapy Association have accorded the Council their full cooperation in the establishment and maintenance of standards in this field.

While the number of schools thus far approved is limited to fourteen, several others are under consideration. Additions to the list will be made as other schools apply and are found eligible.

Applications have been received from schools of massage erroneously labeled as physical therapy schools. The Council has not adopted standards for training in massage, since this is only one phase of the broad field of physical therapy. The abuse of this valuable means of therapy by cult practitioners and technicians in attempting to cure internal conditions is too well known and any official endorsement of training for this single method of treatment could only result in encouraging quackery. It is for this reason that the Council has designated in the "Essentials" that "acceptable schools for training physical therapy technicians may be conducted by accredited universities, colleges or hospitals." Commercial schools, then, cannot be considered for recognition.

The American Registry of Physical Therapy Technicians, sponsored by the American Congress of Physical Therapy, has become recognized during the past three years as a means of identifying those qualified. The Board of Registry accepts for examination graduates of schools approved by the Council on Medical Education and Hospitals. The objects of the Registry among others are:

"To maintain the minimum standards of educational and technical qualifications as given by the Council on Medical Education and Hospitals of the American Medical Association for technicians administering physical therapy in hospitals, clinics and physicians' offices."

"To cooperate with the Council on Medical Education and Hospitals of the American Medical Association in its investigation, classification and periodic inspection

of schools which conduct training courses for physical therapy technicians"

Information concerning registration may be secured through Miss Marion G. Smith, registrar of the American Registry of Physical Therapy Technicians, 30 North Michigan Avenue, Chicago

including basic sciences. In agreement with the Board of Registry of the American Society of Clinical Pathologists, this ruling became effective Jan 1, 1938

Although almost all larger hospitals admit occasional students or volunteers for training as technicians for whom no systematic course of instruction can be pro-

### Approved Schools for Physical Therapy Technicians

The following list of schools for physical therapy technicians represents the fourth printing made since the House of Delegates of the American Medical Association adopted standards for such schools in 1936

Name and Location of School	Direction	Entrance Requirement	Length of Course	Student Capacity	Tuition	Certificate or Degree
Children's Hospital Los Angeles <sup>1</sup>	John C. Wilson M.D.	(a) R.N. (b) Grad phys ed	12 mos	10	\$120	Diploma
Stanford University Hospital San Francisco	W. H. Northway M.D.	(a) R.N. (b) Grad phys ed	12 mos	6	\$110	Certificate
Walter Reed General Hospital Washington D.C.	Maj. W. W. McCaw M.D.	Grad phys ed	12 mos	10	None	Certificate
Northwestern University Medical School Chicago <sup>2</sup>	John S. Coulter M.D.	(a) R.N. (b) Grad phys ed (c) Coll grad	9 mos	13	\$200	Certificate
Bowdoin School of Physical Education Boston <sup>3</sup>	Howard Moore M.D.	High school grad	3 and 4 yrs <sup>a</sup>	10	\$400 yr	Certificate or B.S.
Harvard Medical School Course 44 Boston <sup>4</sup>	F. R. Ober M.D.	(a) R.N. (b) Grad phys ed (c) Coll grad	9 mos	16	\$100	Certificate
Boston University Sargent College of Physical Education Cambridge Mass <sup>5</sup>	Prof. E. Hermann Dean	High school grad	4 yrs	20	\$340 yr	B.S.
Battle Creek College Battle Creek Mich <sup>6</sup>	Paul Roth M.D.	(a) R.N. (b) 2 yrs coll (c) Grad phys ed	17 mos		\$200	Certificate or B.S.
St. Louis University School of Nursing St. Louis <sup>7</sup>	A. J. Kotlik M.D.	High school grad	4 yr.	4	Univ fees	B.S.
University of Buffalo Buffalo <sup>8</sup>	G. G. Martin, M.D.	R.N.	18 mos	8	Univ fees	B.S.
Hospital for Ruptured and Crippled New York City <sup>9</sup>	K. C. Hanson M.D.	(a) R.N. (b) Grad phys ed	9 mos	10	\$ 00	Diploma
D. T. Watson School of Physiotherapy (affiliated with Univ. of Pittsburgh School of Medicine) Leesdale Pa. <sup>10</sup>	Jessie Wright M.D.	(a) Grad phys ed (b) 2 yrs premed	22 mos	8	None	Diploma or B.S.
College of William and Mary Richmond Va. <sup>11</sup>	H. H. Hibbs Jr. Ph.D.	(a) R.N. (b) Grad phys ed (c) 3 yrs coll	4 and 12 mos <sup>b</sup>	6	Coll fees	Certificate
University of Wisconsin Madison <sup>12</sup>	E. A. Pohle M.D.	(a) R.N. (b) Grad phys ed	9-12 mos	20	Univ fees	Certificate

### Notes

- a Four year course leads to B.S. degree from Simmons College  
b Twelve month course for those with three years college

### Affiliated Clinical Facilities

- 1 Glendale Sanitarium and Hospital Glendale and Cedars of Lebanon Hospital Good Hope Clinic and Los Angeles County Hospital Los Angeles
- 2 Langdon School for Crippled Children Washington D.C.
- 3 Michael Reese Hospital Montgomery Ward Clinics, Passavant Memorial Hospital and St. Luke's Hospital Chicago
- 4 Boston City Hospital Children's Hospital Massachusetts General Hospital and Robert Breck Brigham Hospital Boston Cambridge Hospital Cambridge and Newton Hospital, Newton
- 5 Children's Hospital and Convalescent Home Harvard Infirmary Paralysis Commission Clinic Industrial School for Crippled and

- Deformed Children Massachusetts General Hospital Peter Bent Brigham Hospital and Robert Breck Brigham Hospital Boston and Cambridge Hospital, Cambridge
- 6 Industrial School for Crippled and Deformed Children Massachusetts General Hospital Massachusetts Memorial Hospital and Perkins Institute for the Blind Boston and Cambridge Hospital Cambridge
- 7 Ann J. Kellogg School Battle Creek and Battle Creek Hospital
- 8 Firmin Desloge Hospital Mount St. Rose Sanatorium and St. Mary's Hospital St. Louis
- 9 Buffalo City Hospital Buffalo
- 10 French Hospital New York Hospital New York Polyclinic Hospital and Reconstruction Hospital New York City
- 11 Allegheny General Hospital Children's Hospital Elizabeth Steel Magee Hospital Falk Clinic Industrial Home for Crippled Children and St. Francis Hospital Pittsburgh
- 12 Crippled Children's Hospital Stuart Circle Hospital and Wheel Don Clinic Richmond
- 13 State of Wisconsin General Hospital Madison

At the November 1937 meeting of the Council certain changes were made in the "Essentials" for the purpose of clarification of meaning but which did not alter the original considerations in the requirements

### APPROVED SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS

The report on the original survey of 196 schools in the United States in which the method of examining schools and the findings are described, appeared in the Educational Number of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION Aug 29 1936. Inspections of schools continue as a regular part of the Council's work and the revisions of the approved list are made regularly. The accompanying list represents the fourth printing and contains the names of 136 schools conforming to the minimum requirements.

In 1937 the Council voted to increase the admission requirement from one to two years of college work

and the Council does not regard such casual apprenticeships as justifying recognition as a school.

The adoption of standards for laboratory schools by the American Medical Association and the publication of lists of approved schools have already guided hundreds, who aspire to this field, away from the advertising commercial schools into acceptable courses of training. Hospitals throughout the country are recognizing more and more that graduation from an approved school or registration is the most reliable means of identifying qualified technicians. Thus, uncontrolled education of laboratory technicians by commercial schools is no longer accepted as satisfactory.

Training in commercial schools alone will not permit students to enter examinations of the Board of Registry of the American Society of Clinical Pathologists.

More detailed information may be obtained from the directors of individual schools or by addressing the Council on Medical Education and Hospitals.

Approved Schools for Clinical Laboratory Technicians

The following list of schools for clinical laboratory technicians represents the fourth printing made since the House of Delegates of the American Medical Association adopted standards for such schools in 1936

	Name and Location of School	Direction	Entrance Requirement	Hospital Bed Capacity	Yearly Admissions	Duration of Course	Number of Students	Tuition	Certificate or Diploma
1	University of Arkansas (Little Rock City Hospital) Little Rock, 1	J J Andujar M D	2 yrs coll	175	2 037	12 mos	4	\$100	Certificate 1
2	Children's Hospital Los Angeles, 2	O M Hyland M D	Coll degree	193	4 134	12 mos	3	None	None 2
3	College of Medical Frangolists (White Memorial Hospital) Los Angeles, 3	O B Pratt M D	2 yrs coll	174	3 288	12 mos	3	\$100	Certificate 2
4	Los Angeles County Hospital Los Angeles, 4	N G Evans M D	Coll degree	2 877	53 717	12 mos	8	\$50	Certificate 4
5	Huntington Memorial Hospital Pasadena, 5	A G Ford M D	3 yrs coll	178	6 091	12 mos	3	None	Certificate 5
6	St Mary's Hospital San Francisco, 6	Z P Zoller M D	2 yrs coll	118	4 417	12 mos	4	None	Certificate 6
7	St Mary's Hospital San Francisco, 7	W P Storer M D	2 yrs coll	240	4 417	24 mos	4	None	Certificate 7
8	University of California Hospital San Francisco, 8	I O Schumacher M D	2 yrs coll	273	6 380	16 mos	4	None	None 8
9	Children's Hospital Denver, 9	F I Dobos M D	2 yrs coll	200	3 068	12 mos	2	None	Certificate 9
10	University of Denver Denver, 10	Philip Hilkwitz, M D	High sch grad			4 yrs	52	\$225 yr	B S 10
11	University of Georgia School of Medicine (University Hospital) Augusta, 11	E R Pund M D	Coll degree	320	8 206	12 mos	4	\$100	Certificate 11
12	Lincoln University Medical University, 12	E R Krueck M D	B S			18 mos	8	\$225 yr	M S 12
13	Michael Reese Hospital Chicago, 13	K M Howell M D	2 yrs coll	505	17 850	12 mos	12	\$100	Certificate 13
14	St. Simon Hospital Chicago, 14	I Davidsohn M D	2 yrs coll	176	6 520	18 mos	5	\$125	Diploma 14
15	Northern University Medical School (Passavant Memorial Hospital) Chicago, 15	H L Alt M D	2 yrs coll	177	4 637	12 mos	8	\$50	Certificate 15
16	Northwestern Hospital, Evanston, 16	E L Benjamin M D	Coll degree	228	8 684	12 mos	4	\$100	Certificate 16
17	St. John's Hospital Springfield, 17	F W Jight, M D	2 yrs coll	500	10 707	12 mos	5	\$50	None 17
18	St. Theresa's Hospital Waukegan, 18	Ernest Pfabram M D	2 yrs coll	150	2 668	12 mos	2	\$100	Diploma 18
19	Indianapolis City Hospital Indianapolis, 19	H C Thornton M D	2 yrs coll	634	10 617	18 mos	2	\$50	Certificate 19
20	Indiana University School of Medicine (Indiana University Hospital) Indianapolis, 20	G G Culbertson M D	Coll degree	466	9 471	24 mos	1	None	Diploma 20
21	Methodist Episcopal Hospital Indianapolis, 21	H M Banks M D	B S or B A	501	22 290	18 mos	3	None	Certificate 21
22	South Bend Medical Laboratory South Bend, 22	A S Giordano M D	2 yrs coll			18 mos	3	\$125 yr	None 22
23	Bethany Methodist Hospital Kansas City, 23	W W Summerville M D	Coll degree	120	2 554	12 mos	3	None	Certificate 23
24	University of Kansas Hospital Kansas City, 24	C G Leitch M D	Coll grad	300	6 726	12 mos	7	Univ fees	Certificate 24
25	St. Francis Hospital Wichita, 25	C A Helmig M D	2 yrs coll	275	6 050	12 mos	6	\$150	Diploma 25
26	Wichita Hospital Wichita, 26	M L Jones M D	2 yrs coll	100	2 416	12 mos	2	\$150	Certificate 26
27	St. Joseph's Hospital Lexington, 27	F S Maxwell M D	2 yrs coll	197	6 707	12 mos	4	\$150	Certificate 27
28	University of Kentucky Lexington, 28	M Scherago D V M	High sch grad		60	4 yrs	8	Univ fees	B S 28
29	Joseph Infirmary Louisville, 29	H M Weeter M D	2 yrs coll	320	6 390	12 mos	5	\$150	None 29
30	St. Mary and Elizabeth Hospital Louisville, 30	H M Weeter M D	2 yrs coll	135	3 928	12 mos	7	\$190	None 30
31	State Board of Health Louisville, 31	L H South M D	2 yrs coll			12 mos	28	\$300	Diploma 31
32	Loyola University New Orleans, 32	J G Arnold Jr Ph D	High sch grad			4 yrs	25	Univ fees	B S 32
33	Central Maine General Hospital Lewiston, 33	Julius Gottlieb M D	B S or B A	186	3 737	15 mos	3	\$100	Certificate 33
34	Mercy Hospital Baltimore, 34	H T Collenberg, M D	2 yrs coll	255	8 158	18 mos	14	\$150	Certificate 34
35	Simmons College (Caulner Hospital) Boston, 35	O M Hilliard A B	Coll degree	141	3 915	12 mos	4	\$300	Certificate 35
36	Mercy Hospital Springfield, 36	E Dwyer M D	2 yrs coll	370	5 853	12 mos	7	None	Certificate 36
37	Worcester City Hospital Worcester, 37	R H Goodale, M D	2 yrs coll	480	9 507	12 mos	6	None	Certificate 37
38	Worcester State Hospital Worcester, 38	J M Looney M D	Coll degree	2 334	2 332	12 mos	2	None	Certificate 38
39	Stella Y. Post Montgomery Hospital Battle Creek, 39	A A Humphrey M D	2 yrs coll	140	4 021	12 mos	3	\$97	Certificate 39
40	St. Joseph's Hospital Bay City, 40	W G Gamble Jr M D	2 yrs coll	140	5 314	12 mos	3	\$150	Certificate 40
41	City of Detroit Receiving Hospital (Wayne University), Detroit, 41	O A Brines M D	3 yrs coll	650	21 365	12 mos	6	None	B S 41
42	Grace Hospital Detroit, 42	C I Owen M D	2 yrs coll	468	15 444	12 mos	6	\$150	Certificate 42
43	University of Michigan (Wayne University), Detroit, 43	F W Hartman M D	B S or B A	573	10 041	12 mos	10	None	M S 43
44	Provident Hospital Detroit, 44	I E Davis M D	B S or B A	300	12 961	12 mos	5	\$50	Diploma 44
45	Wayne University Detroit, 45	C W Creaser Ph D	High sch grad			4 yrs	31	Univ fees	B S 45
46	Michigan State Hospital Detroit, 46	D O Beaver M D	3 yrs coll	223	7 034	12 mos	1	None	B S 46
47	Michigan State College East Lansing, 47	Ward Giffner D V M	High sch grad			4 yrs	64	Coll fees	B S 47
48	William J. Seymour Hospital Ellettsville, 48	S E Gould M D	3 yrs coll	1 450	7 452	12 mos	3	None	B S 48
49	College of St. Scholastica (St. Mary's Hospital) Duluth, 49	G L Berdez M D	High sch grad	260	5 313	4 yrs	20	Coll fees	B S 49
50	St. Luke's Hospital Duluth, 50	A H Wells M D	2 yrs coll	237	0 080	18 mos	4	None	None 50
51	Fairview Hospital Minneapolis, 51	Louise Baker, M D	2 yrs coll	200	4 768	24 mos	2	\$100	Certificate 51
52	Minneapolis General Hospital Minneapolis, 52	N H Lufkin M D	Coll grad	616	10 021	12 mos	6	None	None 52

Approved Schools for Clinical Laboratory Technicians—Continued

Name and Location of School	Direction	Entrance Requirement	Hospital Bed Capacity	Early Admissions	Duration of Course	Number of Students	Tuition	Certificate or Diploma
MINNESOTA—(Continued)								
1 Northwestern Hospital Minneapolis	M J Smith M D	2 yrs coll	165	7 341	12 mos	2	None	Certificate
4 Swedish Hospital Minneapolis	C R Drake M D	2 yrs coll	225	0 1 16	24 mos	8	\$12.50	Certificate
6 University of Minnesota Minneapolis	W A O'Brien M D	High sch grad	295	0 10	4 yrs	260	\$100 yr	B S
6 Charles F Miller Hospital (Macalester College) St Paul	Kanno Ikeda M D	1 yrs coll			12 mos	6	\$110	B A
7 Vicksburg, Sanitarium and Crawford Street Hospital, Vicksburg	I S J Applebe M D	2 yrs coll	75	2 249	24 mos	6	None	Certificate
8 University of Missouri School of Medicine Columbia	V P Neal M D	4 yrs coll			12 18 mos	3	Univ fees	None
9 Kansas City Health Department Laboratory Kansas City	R F Duncan M D	2 yrs coll	15		18 mos	15	None	Certificate
60 Missouri Hospital, Kansas City	R F Korthesch M D	Coll degree	120	7 367	18 mos	15	None	None
61 Research Hospital, Kansas City	F C Kerr M D	2 yrs coll	200	6 79	12 mos	4	None	None
62 St Joseph Hospital, Kansas City	R W Kerr M D	Coll degree	220	7 106	12 mos	6	None	Certificate
63 St Luke's Hospital, Kansas City	F C Helwig M D	2 yrs coll	103	4 733	16 mos	5	None	None
64 St Mary's Hospital, Kansas City	C G Letch M D	Coll grad	160	4 717	12 mos	5	\$10	Certificate
65 St Louis University School of Nursing St Louis	A L Casey M D	High sch grad			4 yrs	26	Univ fees	B S
66 State University of Montana Missoula	D M Hetler Ph D	High sch grad			4 yrs	31	Univ fees	B A
67 Bryan Memorial Hospital Lincoln	M J Bremer M D	2 yrs coll	100	2 410	12 mos	2	None	Certificate
68 Lincoln Central Hospital Lincoln	J M Neely M D	2 yrs coll	145	7 242	12 mos	2	None	Diploma
69 University of Nebraska Hospital Omaha	J P Tollman M D	2 yrs coll	210	3 543	12 mos	6	None	Certificate
70 Mary Hitchcock Memorial Hospital, Hanover	R E Miller M D	2 yrs coll	142	3 234	12 mos	4	\$50	Certificate
71 Bender Hygienic Laboratory Albany	J J Clemmer M D	2 yrs coll			12 mos	7	\$100	Certificate
72 Lehigh Hospital Brooklyn	Max Lederer M D	Coll grad	540	17 181	18 mos	7	\$75	Certificate
73 St John's Hospital Brooklyn	Kenneth Strong M D	2 yrs coll	904	4 72	18 mos	7	None	None
74 Buffalo City Hospital Buffalo	D K Miller M D	2 yrs coll	1 082	10 532	24 mos	8	None	Certificate
75 Buffalo General Hospital Buffalo	K I Terplan M D	Coll grad	477	10 760	12 18 mos	0	\$50	Certificate
76 St Joseph's Hospital Buffalo	I I Bexer M D	2 yrs coll	189	7 640	12 mos	3	\$10	Certificate
77 New York Post Graduate Medical School and Hospital, New York City	W J MacNeal M D	Coll grad	410	9 554	12 mos	4	\$500	Certificate
78 Rochester General Hospital Rochester	J A Gaspar M D	Coll degree	312	8 533	18 mos	4	None	Certificate
79 Ellis Hospital Schenectady	H B Kellert M D	R N or 2 yrs coll	241	8 379	12 18 mos	8	None	Certificate
80 Russell Sage College (Sumner Hospital) Troy	V C Jacobsen M D	High sch grad	165	3 450	4 yrs	4	Coll fees	B A
81 Duke Hospital Durham	D T Smith M D	2 yrs coll	400	10 974	16 mos	12	\$50	Certificate
82 Institute of Pathology Western Reserve University (University Hospitals) Cleveland	H Goldblatt M D	2 yrs coll	698	13 469	12 mos	15	\$70	Certificate
83 Mt Sinai Hospital Cleveland	B S Kline M D	2 yrs coll	920	8 270	12 mos	15	\$975	Certificate
84 Starling Trolan University Hospital Columbus	H L Reinhardt M D	B S or B A	246	5 289	12 mos	5	\$100	Certificate
85 White Cross Hospital Columbus	R S Fidler M D	B S or B A	246	7 097	12 mos	3	None	Certificate
86 Huron Road Hospital East Cleveland	Edward Goodsett M D	2 yrs coll	202	6 977	12 mos	4	None	None
87 College of Mount St Joseph on the Ohio Mount St Joseph	R J Norris M D	High sch grad			12 mos	2	Coll fees	B S
88 Youngstown Hospital Youngstown	G B Kramer M D	2 yrs coll	372	9 919	12 mos	2	None	None
89 St Anthony's Hospital Oklahoma City	Hugh Jeter M D	B S or B A	700	9 076	12 mos	3	None	None
90 State University and Crippled Children's Hospitals Oklahoma City	Hugh Jeter M D	B S or B A	418	0 455	12 mos	3	None	None
91 Emanuel Hospital Portland	H H Foskett M D	Coll degree	867	8 527	12 mos	2	\$150	None
92 Good Samaritan Hospital Portland	C H Manlove M D	2 yrs coll	316	13 140	12 mos	4	\$750	None
93 St Vincent's Hospital Portland	D Robertson M D	2 yrs coll	384	10 406	12 mos	3	None	None
94 University of Oregon Portland	M F Gourley M D	2 yrs coll			12 mos	4	None	Certificate
95 Abington Memorial Hospital Abington	John Elman M D	2 yrs coll	251	6 126	15 mos	3	Coll fees	B S
96 Moreaux College for Women Bethlehem	J H Beynon D Sc	High sch grad			4 yrs	2	\$75	Certificate
97 Bryn Mawr Hospital Bryn Mawr	H A Rothrock Jr M D	2 yrs coll	192	4 946	12 mos	2	\$12.50	Certificate
98 Elizabeth Arden Hospital Darby	M A Strumia M D	2 yrs coll	240	7 127	12 mos	4	None	Certificate
99 Harrisburg Hospital Harrisburg	G R Kennedy M D	R N or 2 yrs coll	200	4 267	12 mos	4	None	Certificate
100 Harrisburg Hospital Harrisburg	C R Moffitt M D	2 yrs coll	239	6 938	12 mos	6	None	Certificate
101 Harrisburg Hospital Harrisburg	H Van Horn M D	Coll degree	140	7 744	12 mos	4	None	Diploma
102 Germantown University (Cecil Gelsinger Memorial Hospital Danville) Lewisburg	H E Hunt M D	High sch grad	161	5 691	4 1/2 yrs	4	Univ fees	B S
103 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
104 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
105 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
106 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
107 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
108 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
109 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
110 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
111 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
112 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
113 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
114 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
115 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
116 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
117 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
118 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
119 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate
120 Jefferson Medical College Hospital Philadelphia	B J Lynch M D	2 yrs coll	140	7 701	12 mos	2	\$100	Certificate



110	Rending Hospital (Vibrant College) Rending	252	12 mos	6 067	110	B.S.
111	Voas Taylor Hospital Scranton	125	12 mos	2 160	111	Diploma
112	Scranton State Hospital Scranton	180	12 mos	4 406	112	None
SOUTH CAROLINA						
113	Spartanburg General Hospital Spartanburg	304	18 mos	5 767	113	Diploma
TENNESSEE						
114	Knoxville General Hospital Knoxville	240	18 mos	7 166	114	Diploma
115	John Gaston Hospital (University of Tennessee) Memphis	489	13 mos	14 567	115	Certificate
ILLINOIS						
116	Hotel Dieu Hospital Beaumont	161	24 mos	2 903	116	None
117	Baylor University Hospital Dallas	370	12 mos	13 787	117	Certificate
118	St Paul's Hospital Dallas	270	12 mos	8 947	118	Certificate
119	John Seely Hospital Galveston	422	12 mos	8 830	119	Certificate
120	St Mary's Infirmary Galveston	200	12 mos	3 962	120	Certificate
121	Robert B Green Memorial Hospital San Antonio	175	12 mos	4 942	121	Certificate
VIRGINIA						
122	College of William and Mary (Stuart Circle Hospital) Richmond	90	4 yrs	2 862	122	B.S.
123	Johnston Willis Hospital Richmond	125	12 mos	3 941	123	None
124	Medical College of Virginia Hospital Division Richmond	423	12 mos	9 919	124	Certificate
125	Stuart Circle Hospital Richmond	50	12 mos	2 862	125	None
WASHINGTON						
126	Deaconess Hospital Spokane	227	12 mos	4 958	126	None
127	St. Mary's Hospital Spokane	204	12 mos	9 068	127	None
128	St. Luke's Hospital (St. Joseph's General Hospital) Pullman	170	12 mos	3 388	128	Diploma
129	St. Joseph's Hospital Pullman	300	18 mos	3 960	129	Certificate
130	Tacoma General Hospital Tacoma	180	12 mos	4 330	130	Diploma
WISCONSIN						
131	Madison General Hospital Madison	160	12 mos	4 860	131	None
132	St. Mary's Hospital Madison	170	12 mos	7 016	132	Diploma
133	University of Wisconsin (State of Wisconsin General Hospital) Madison	640	12 yrs	11 680	133	B.S.
134	Waukesha Hospital The Parsonage Milwaukee	22	12 mos	7 138	134	Certificate
135	St. Joseph's Hospital Milwaukee	35	24 mos	7 238	135	B.S.
136	Milwaukee County General Hospital Wauwatosa	1000	24 mos	16 832	136	Certificate

NOTES		No of Beds	Yearly Admissions	No of Beds	Yearly Admissions
Students from other than affiliated colleges must have B.S. degree					
From Wayne University Detroit or Michigan State College East Lansing		130	4 180	22	Kansas City General Hospital Kansas City
Students from other than affiliated colleges must have degree		528	11 196	23	Kansas City General Hospital Kansas City
Includes twelve months' lay training		370	6 300	24	St. Mary's Hospital St. Louis
Visitors students in fourth year from University of Minnesota		292	9 434	25	St. Mary's Hospital St. Louis
for B.S. degree		118	3 025	26	St. Mary's Hospital St. Louis
Students admitted from other than affiliated college		50	733	27	St. Mary's Hospital St. Louis
Includes six months' lay training		40	678	28	St. Mary's Hospital St. Louis
Includes three months' lay training		75	1 489	29	St. Mary's Hospital St. Louis
For luncheon laundry and coverage for breakage				30	St. Mary's Hospital St. Louis
Students admitted from other colleges				31	St. Mary's Hospital St. Louis
Credit may be applied toward B.S. degree following three years				32	St. Mary's Hospital St. Louis
at College of William and Mary				33	St. Mary's Hospital St. Louis
From Marquette University Milwaukee					
ADDITIONAL AFFILIATIONS					
1	Polom Clinic Little Rock	260	5 040	54	State Public Health Laboratory Lincoln
2	Los Angeles City Health Department	200	6 031	55	Dartmouth Medical School Laboratories Hanover
3	Los Angeles City Health Department	200	6 031	56	St. Mary's Hospital St. Louis
4	St. Anthony Hospital Denver	104	2 081	57	St. Mary's Hospital St. Louis
5	St. Anthony Hospital Denver	300	135	58	St. Mary's Hospital St. Louis
6	St. Anthony Hospital Denver	104	2 081	59	St. Mary's Hospital St. Louis
7	St. Anthony Hospital Denver	104	2 081	60	St. Mary's Hospital St. Louis
8	St. Anthony Hospital Denver	104	2 081	61	St. Mary's Hospital St. Louis
9	St. Anthony Hospital Denver	104	2 081	62	St. Mary's Hospital St. Louis
10	St. Anthony Hospital Denver	104	2 081	63	St. Mary's Hospital St. Louis
11	St. Anthony Hospital Denver	104	2 081	64	St. Mary's Hospital St. Louis
12	St. Anthony Hospital Denver	104	2 081	65	St. Mary's Hospital St. Louis
13	St. Anthony Hospital Denver	104	2 081	66	St. Mary's Hospital St. Louis
14	St. Anthony Hospital Denver	104	2 081	67	St. Mary's Hospital St. Louis
15	St. Anthony Hospital Denver	104	2 081	68	St. Mary's Hospital St. Louis
16	St. Anthony Hospital Denver	104	2 081	69	St. Mary's Hospital St. Louis
17	St. Anthony Hospital Denver	104	2 081	70	St. Mary's Hospital St. Louis
18	St. Anthony Hospital Denver	104	2 081	71	St. Mary's Hospital St. Louis
19	St. Anthony Hospital Denver	104	2 081	72	St. Mary's Hospital St. Louis
20	St. Anthony Hospital Denver	104	2 081	73	St. Mary's Hospital St. Louis
21	St. Anthony Hospital Denver	104	2 081	74	St. Mary's Hospital St. Louis
22	St. Anthony Hospital Denver	104	2 081	75	St. Mary's Hospital St. Louis
23	St. Anthony Hospital Denver	104	2 081	76	St. Mary's Hospital St. Louis
24	St. Anthony Hospital Denver	104	2 081	77	St. Mary's Hospital St. Louis
25	St. Anthony Hospital Denver	104	2 081	78	St. Mary's Hospital St. Louis
26	St. Anthony Hospital Denver	104	2 081	79	St. Mary's Hospital St. Louis
27	St. Anthony Hospital Denver	104	2 081	80	St. Mary's Hospital St. Louis
28	St. Anthony Hospital Denver	104	2 081	81	St. Mary's Hospital St. Louis
29	St. Anthony Hospital Denver	104	2 081	82	St. Mary's Hospital St. Louis
30	St. Anthony Hospital Denver	104	2 081	83	St. Mary's Hospital St. Louis
31	St. Anthony Hospital Denver	104	2 081	84	St. Mary's Hospital St. Louis
32	St. Anthony Hospital Denver	104	2 081	85	St. Mary's Hospital St. Louis
33	St. Anthony Hospital Denver	104	2 081	86	St. Mary's Hospital St. Louis
34	St. Anthony Hospital Denver	104	2 081	87	St. Mary's Hospital St. Louis
35	St. Anthony Hospital Denver	104	2 081	88	St. Mary's Hospital St. Louis
36	St. Anthony Hospital Denver	104	2 081	89	St. Mary's Hospital St. Louis
37	St. Anthony Hospital Denver	104	2 081	90	St. Mary's Hospital St. Louis
38	St. Anthony Hospital Denver	104	2 081	91	St. Mary's Hospital St. Louis
39	St. Anthony Hospital Denver	104	2 081	92	St. Mary's Hospital St. Louis
40	St. Anthony Hospital Denver	104	2 081	93	St. Mary's Hospital St. Louis
41	St. Anthony Hospital Denver	104	2 081	94	St. Mary's Hospital St. Louis
42	St. Anthony Hospital Denver	104	2 081	95	St. Mary's Hospital St. Louis
43	St. Anthony Hospital Denver	104	2 081	96	St. Mary's Hospital St. Louis
44	St. Anthony Hospital Denver	104	2 081	97	St. Mary's Hospital St. Louis
45	St. Anthony Hospital Denver	104	2 081	98	St. Mary's Hospital St. Louis
46	St. Anthony Hospital Denver	104	2 081	99	St. Mary's Hospital St. Louis
47	St. Anthony Hospital Denver	104	2 081	100	St. Mary's Hospital St. Louis

# HOSPITALS REGISTERED BY THE AMERICAN MEDICAL ASSOCIATION

The following list contains the names of 6,128 hospitals, sanatoriums and related institutions that are located in the United States and 243 in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands. It omits the names of 617 hospitals which, after investigation, were not accepted. The inclusion of the name of any institution may be taken as an indication that evidence concerning irregular or unsafe practices in that institution has not come to the attention of the Council on Medical Education and Hospitals. The list in each state is given in two sections: (1) hospitals and sanatoriums, and (2) related institutions. The related institutions include some general hospitals lacking certain essentials, nursing homes, school infirmaries, prison infirmaries, custodial and other institutions designed to give some medical, nursing or convalescent care in an ethical and acceptable manner, but not strictly hospitals. In the statistics the two classifications are consolidated. The words "No data supplied" following the name of a hospital mean that no report was received although at least three requests were sent.

## KEY TO SYMBOLS AND ABBREVIATIONS

- \* Approved for general internship the fifth year in medicine by the Council on Medical Education and Hospitals
- + Approved for certain residencies in specialties for graduates in medicine who have already had a general internship or its equivalent in private practice

- ◊ School of nursing accredited by state board of nurse examiners
- ◊ Affiliated for nurse training on state accredited basis

The column headed "Type of Service" tells what diseases or conditions are treated in each institution, as follows:

Ca	Cancer	ENT	Eye, ear, nose and throat	Inst	Institutional	Orth	Orthopedic
Card	Cardiac	Gen	General	Mat	Maternity	SkCa	Skin and cancer
Chil	Children	G&TB	General and tuberculosis	MatCh	Maternity and children	TB	Tuberculosis
Chr	Chronic	Ine	Incurable	MeDe	Mentally deficient	TbIso	Tuberculosis and isolation
Conv	Convalescence and rest	Indus	Industrial	Ment	Mental	TbOr	Tuberculosis and orthopedic
Drug	Drug and alcoholic	Iso	Isolation	N&M	Nervous and mental	Ven	Veneral
Lpil	Epileptic						

The column headed "Control" indicates for each institution the ownership, control, or auspices under which it is conducted, as follows:

**GOVERNMENTAL**

Federal  
Indian Affairs  
United States Army  
United States Navy  
United States Public Health Service  
Veterans Administration Facility

State  
City  
County  
City County

**NONPROFIT ORGANIZATIONS**

Church  
Fraternal  
Nonprofit association

**PROPRIETARY**

Individual  
Partnership  
Corporation  
(unrestricted as to profit)

## ABBREVIATIONS

CyCo	City and county	Frat	Fraternal	NPAsn	Nonprofit association
Corp	Corporation unrestricted as to profit	IA	Office of Indian Affairs, Department of the Interior	Part	Partnership
Fed	Federal	Indiv	Individual	USPHS	United States Public Health Service
				Vet	Veterans Administration Facility

Population of cities is based on the 1930 census of the United States Bureau of the Census.

The accompanying list was subject to additions and removals of hospitals until going to press, totals of the list, therefore, may vary from tables 1 and 2, which were compiled slightly in advance of list.

## ALABAMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albertville, 2716—Marshall	Cen	Indiv	24	2	12	6	220
Band Mountain Infirmary	Cen	Indiv	4	3	4	8	400
Alexander City 4319—Tallapoosa	Cen	Indiv	77	6	17	40	1,301
Russell Hospital	Cen	City	121	10	65	1,141	
Anniston 2234—Calhoun	Cen	City	77	6	17	40	1,301
Carner Hospital	Cen	Army	121	10	65	1,141	
Station Hospital	Cen	Army	121	10	65	1,141	
Atmore 306—Escambia	Cen	NPAsn	24	2	21	6	491
Atmore General Hospital	Cen	NPAsn	24	2	21	6	491
Bellamy 317—Sumter	Cen	Indiv	16	2	6	2	12
Bellamy Hospital	Cen	Indiv	16	2	6	2	12
Bessemer 20721—Jefferson	Cen	Corp	75	4	54	2	863
Bessemer General Hospital	Cen	Corp	75	4	54	2	863
Birmingham 23678—Jefferson	Cen	Church	147	12	30	95	4,285
Birmingham Baptist Hosp	Cen	NPAsn	50			31	977
Children's Hospital	Cen	NPAsn	50			27	447
Hill Crest Sanitarium	Cen	NPAsn	44	40	1,500	316	10,577
Hillman Hospital	Cen	NPAsn	160			62	192
Jefferson Sanatorium	Cen	NPAsn	210	16	322	107	5,841
Norwood Hospital	Cen	NPAsn	170	8	197	124	3,744
St. Vincent's Hospital	Cen	Church	127	17	572	96	4,323
South Highlands Infirmary	Cen	Corp	127	17	572	96	4,323
26, Crippled Children's Clinic	Cen	NPAsn	3			27	224
Clanton 1847—Chilton	Cen	NPAsn	2	2	No data supplied		
Central Alabama Hospital	Cen	NPAsn	50	4	75	29	905
Decatur 1550—Morgan	Cen	NPAsn	50	4	75	29	905
Benevolent Society Hosp	Cen	NPAsn	50	4	75	29	905
Dothan 16046—Houston	Cen	Indiv	60	6	66	57	2,671
Fraser Hill Hospital	Cen	Indiv	100	7	112	61	2,574
Moody Hospital	Cen	Indiv	100	7	112	61	2,574
Enterprise 3707—Coffee	Cen	Indiv	20	3	28	5	238
Clifton Hospital	Cen	Indiv	20	3	28	5	238
Fufaula 208—Barbour	Cen	Indiv	70	6	70	2	8
Britt Infirmary	Cen	Indiv	0	6	2	16	8
Calter Hospital	Cen	Indiv	0	6	2	16	8
Fairfield 1100—Jefferson	Cen	NPAsn	2	2	620	1	12
Employees Hospital of the Tennessee Coal Iron and Railroad Company	Cen	NPAsn	2	2	620	1	12

## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Flint (Decatur P O) 134—Morgan	TB	County	20			21	90
Morgan County Tuberculosis Sanatorium	TB	County	20			21	90
Florida 2880—Covington	Gen	Indiv	40	3	20	12	470
Young Infirmary and Lakeview Hospital	Gen	Indiv	40	3	20	12	470
Florence 11720—Lauderdale	Gen	City	40	6	74	19	910
Eliza Coffee Memorial Hosp	Gen	City	40	6	74	19	910
Childsden 24042—Lowndes	Cen	Indiv	50	14	7	37	1,111
Forre General Hospital	Cen	Indiv	50	14	7	37	1,111
Holy Name of Jesus Hosp	Cen	Church	75	10	130	48	2,000
Greenville 390—Butler	Cen	Indiv	26	6	16	5	71
Speir Hospital	Cen	Indiv	26	6	16	5	71
Stabler Infirmary	Cen	Indiv	26	6	16	5	71
Guntersville Dam—Marshall	Cen	NPAsn	18	2	4	10	4
Guntersville Dam Infirmary	Cen	NPAsn	18	2	4	10	4
Huntsville 1154—Madison	Cen	NPAsn	50	6	104	29	1,414
Huntsville Hospital	Cen	NPAsn	50	6	104	29	1,414
Jasper 5317—Walker	Cen	Corp	60	6	60	2	8
Peoples Hospital	Cen	Corp	60	6	60	2	8
Walker County Hospital	Cen	Corp	60	6	60	2	8
Mobile 68002—Mobile	Cen	City	126	15	4	110	1,110
Mobile County Tuberculosis Sanatorium	TB	CyCo	5		No data supplied		
Mobile Infirmary	Cen	NPAsn	110	10	144	68	4,111
Providence Infirmary	Cen	Church	8	12	191	47	1,577
U S Marine Hospital	Cen	USPHS	170			1,3	1,410
Montgomery 6604—Montgomery	Cen	Indiv	20	6	8	1	6
Fitts Hill Hospital	Cen	Indiv	20	6	8	1	6
Hubbard Hospital	Cen	Indiv	40	12	20	24	1
Montgomery Tuberculosis Sanatorium	TB	NPAsn	78			43	70
St. Margaret's Hospital	Cen	Church	122	12	7	4	1,411
Station Hospital	Cen	Army	21	4	15	21	64
St. Vernon 918—Mobile	Cen	State	16			1	6
Sarey Hospital (col)	Cen	State	16			1	6
Opelika 616—Lee	Cen	NPAsn	2	2	23	6	1
East Alabama Hospital	Cen	NPAsn	2	2	23	6	1

Key to symbols and abbreviations is on page 986

## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Roanoke, 4 573—Randolph Knight Sanatorium	Gen	Indiv	32	3	12	23	520
Russellville 3 146—Franklin Russellville Hospital	Gen	Indiv	18	2	15	9	443
Scottsboro 2 304—Jackson Hodges Hospital	Cen	Indiv	20	2	16	6	263
Selma 18 012—Dallas Burwell Infirmary (col)	Gen	Part	25	2	7	12	339
Goldsb'g King Mem Hosp	Gen	NPA's'n	52	10	56	39	1 429
Good Samaritan Hosp (col)	Unit of	Selma Baptist Hospital	90	12	143	37	2 370
Selma Baptist Hospital	Cen	NPA's'n	27	8	79	17	886
Vaughan Memorial Hospital	Gen	Corp	75	8	122	17	1 491
Sheffield 6 221—Colbert Colbert County Hospital	Gen	CyCo	25	12	117	13	78
Sylacauga 4 115—Talladega Drummond Fraser Hosp	Gen	Corp	46	4	27	8	478
Sylacauga Infirmary	Gen	Corp	50	6	86	18	1 340
Talladega 7 596—Talladega Citizens' Hospital	Gen	Corp	35	3	25	14	947
Troy 6 814—Pike Beard Memorial Hospital	Cen	Indiv	35	2	41	20	848
Edge Hospital	Gen	Indiv	374			3 645	1 451
Tuscaloosa 20 639—Tuscaloosa Bryce Hospital	Ment	State	75	10	366	319	2 563
Druid City Hospital	Cen	NPA's'n	346				
Veterans Admin Facility	Gen	Vet	1 495			1 213	2 900
Tu Legue 3 314—Macon Veterans Admin Facility (col)	Cen	Vet	96	6	22	45	910
Tuskegee Institute 375—Macon John Albion Andrew Memorial Hospital (col)*	Cen	NPA's'n	26	4	75	9	530
Wetumpka 2 337—Elmore Wetumpka General Hosp	Gen	Part	15	2	12	3	406
York 1 796—Sumter Hill Hospital	Gen	Indiv					
Related Institutions							
Alabama City 3 344—Etowah Etowah County Tuberculosis Sanatorium	TB	County	25		No data supplied		
Altoona 1 098—Etowah Klein Hospital	Cen	Indiv	12	3	21	5	167
Birmingham 2 9 678—Jefferson Alabama Boys Industrial School	Inst	State	20			5	614
Children's Home Hosp (col)	Cen	NPA's'n	17	3	12	8	391
Miss Quinn's Nursing Home	Conv	Part	10			7	150
Salvation Army Home and Hospital	Mat	Church	45	25	79	36	108
Dothan 16 046—Houston Dr M S Davies Private Hospital	Gen	Indiv	50	6			
East Tallapoosa 2 198—Tallapoosa Community Hospital	Cen	NPA's'n	18	2	17	8	456
Montevallo 1 245—Shelby Peterson Hall	In t	State	36			5	1 449
Montgomery 66 059—Montgomery Fraternal Hospital (col)	Cen	Indiv	45	15	62	19	791
Kilby Prison Hospital	Inst	State	54			36	799
Miram Jackson Home	Inst	Church	25			6	696
Opekka 6 156—Lee Hudson Hospital	Cen	Indiv	12	4	15	3	175
Pell City 835—St Clair Pell City Infirmary	Cen	Indiv	19	1	23	4	176
Talladega 7 596—Talladega Goodnow Hospital (col)	Inst	NPA's'n	20			2	114
Tuscaloosa 20 639—Tuscaloosa Partlow State School	MeDe	State	62			62	4
Wetumpka 2 337—Elmore State Convict Tuberculosis Hospital	TB	State	100			67	39
Summary for Alabama							
Hospitals and sanatoriums	Number	Bed	Average Census	Admissions			
Related institutions	67	11 014	9 409	106 631			
Totals	17	1 149	864	6 003			
Refused registration	54	12 845	10 243	112 934			
	3	120					

## ARIZONA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Ajo 1 100—Pima Phelps Dodge Hospital	Gen	NPA's'n	25	5	122	9	374
Bihee 8 023—Cochise Copper Queen Hospital	Gen	NPA's'n	45	6	152	22	1 212
Chin Lee 65—Apache Chin Lee General Hospital	Gen	IA	22	3	27	15	515
Douglas 9 825—Cochise Cochise County Hospital	Gen	County	45	4	45	30	720
Flagstaff 3 891—Coconino Flagstaff Hospital	Gen	Corp	22	6	50	10	405

## ARIZONA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Florence 1 318—Pinal Pinal County Hospital	Gen	County	27	5	No data supplied		
Fort Defiance 39—Apache Ft Defiance Sanatorium	Tuberculosis Unit of Southern Navajo Gen	eral Hospital					
Southern Navajo General Hospital and Sanatorium	G&TB IA		114	6	89	125	2 136
Ft Huachuca 1 500—Cochise Station Hospital	Gen	Army	65	2	19	19	572
Canado 150—Apache Sage Memorial Hosp (Indian)	Gen	Church	140	15	66	72	1 059
Globe 7 157—Gila Gila County Hospital	Gen	County	50	6	64	36	622
Jerome 4 932—Yavapai United Verde Hospital	Gen	Corp	50	4	77	30	1 057
Keams Canyon 150—Navajo Hopi General Hospital	Gen	IA	36	3	29	30	792
Kingman 2 200—Mohave Mohave General Hospital	Gen	County	30	5	80	25	681
Leupp 200—Coconino Leupp Indian Hospital	Gen	IA	25	2	19	19	466
Mesa 3 711—Maricopa South Side District Hosp	Gen	NPA's'n	40	10	149	32	1 519
Miami 7 693—Gila Miami Inspiration Hospital	Gen	NPA's'n	40	4	133	21	1 157
Morenci 2 200—Greenlee Phelps Dodge Hospital	Gen	NPA's'n	20	1	10	5	80
Phoenix 48 118—Maricopa Arizona State Hospital	Ment	State	900			833	826
Booker T Washington Memorial Hospital (col)	G&TB	Indiv	30	21	32	15	298
Good Samaritan Hosp	Gen	Church	150	20	461	106	3 669
Phoenix Indian Hospital	Gen	IA	65	5	97	47	1 125
Phoenix Indian Sanatorium	TB	IA	150			91	152
Phoenix Sanatorium	TB	Indiv	75			35	70
St Joseph's Hospital	Gen	Church	190	15	480	141	7 188
St Luke's Home	TB	Church	75			30	80
Prescott 5 517—Yavapai Mercy Hospital	Gen	Church	31	7	No data supplied		
Pamsetgaaf Sanatorium	TB	Indiv	40		No data supplied		
St Luke's in the Mountains	Unit of St Luke's Home	Phoenix					
Ray 2 400—Pinal Ray Hospital	Gen	NPA's'n	20	4	18	9	643
Sacaton 315—Pinal Pima Indian Hospital	Gen	IA	38	6	49	22	745
Safford 1 706—Graham Morris Squibb Hospital	Cen	Corp	20	3	11	7	358
San Carlos 100—Gila San Carlos Indian Hosp	Gen	IA	29	3	40	20	557
Sells 250—Pima Indian Onsis Hospital	Gen	IA	50	12	59	26	586
Tempe 2 495—Maricopa State Welfare Sanatorium	TB	State	95			73	70
Tuba City 150—Coconino Western Navajo Hospital	Gen	IA	32	6	29	25	808
Tucson 32 506—Pima Anson Rest Home	TB	Part	30			21	43
Barfield Sanatorium	TB	Indiv	22			11	49
Desert Sanatorium and Institute of Research	Gen	NPA's'n	84			25	263
St Luke's in the Desert Sanatorium	TB	Church	20			20	50
St Mary's Hospital and Sanatorium	G&TB	Church	140	15	312	113	3 327
Southern Methodist Hospital and Sanatorium	C&TB	Church	83	12	58	51	1 520
Southern Pacific Sanat	FB	NPA's'n	92			47	49
Veterans Admin Facility	C&TB	Vet	355			355	829
Whipple—Yavapai Veterans Admin Facility	G&TB	Vet	600			358	1 441
Whiteriver 300—Navajo Ft Apache Agency Hosp	Gen	IA	46	6	25	24	681
Winslow 3 917—Navajo Winslow Indian Sanatorium	TB	IA	51			42	10
Yuma 4 592—Yuma Ft Yuma Indian Hospital	Gen	IA	29	8	18	17	425
Yuma County General Hosp	Gen	County	45	6	157	47	1 725
Related Institutions							
Kayenta 40—Navajo Kayenta Sanatorium	Cen	IA	52	2	3	39	422
McNary 35—Apache McNary Hospital	Gen	NPA's'n	5	1	8	2	87
Nogales 6 006—Santa Cruz St Joseph's Hospital	Gen	Church	30	7	15	5	275
Oracle 200—Pinal La Casa del Encanto	Conv	Indiv	6			3	18
Parker 200—Yuma Colorado River Indian Agency Hospital	Cen	IA	40	4	29	12	295
Phoenix 48 118—Maricopa Helen Lee Sanatorium	TB	Indiv	6			4	16
Prescott 5 517—Yavapai Yavapai County Hosp	InstGen	County	70	3	47	57	770
Tucson 32 506—Pima Arizona State Elk's Association Hospital	TB	Frat	2			19	25
Comstock Children's Hosp	TB	NPA's'n	35			29	25
Means Re t Home	Conv	Indiv	20			40	40
Pima County Hospital	TP	County	40			40	69

Key to symbols and abbreviations is on page 986

## ARIZONA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Reardon Sanatorium	TB	Indiv	16			10	18
San Xavier Indian Sanat	TB	IA	50			34	47
Valentine 168—Mohave							
Truxton Canon Indian Hosp	Gen	IA	12		11	9	236
Williams 2 166—Coconino							
Williams Hospital	Gen	Indiv	10	1	12	2	8

## Summary for Arizona

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	47	4,508	3,178	41,627
Related institutions*	15	402	264	2,495
Totals	62	4,910	3,442	44,122
Refused registration	3	61		

## ARKANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Alexander 141—Pulaski							
McRae Memorial Sanatorium (col.)	TB	State	32			32	33
Arkadelphia, 3 350—Clark							
Townsend Hospital	Gen	Indiv	16	4	18	4	188
Batesville, 4 484—Independence	Gen	Indiv	18		8	6	380
Dr. Gray's Infirmary	Gen	Part	12	1	5	3	225
Johnston and Craig Hosp							
Benton 3 440—Saline	Gen	Indiv	16	2	22	4	192
Blackely Hospital							
Blytheville 10 095—Mississippi	Gen	Indiv	40	6	87	16	900
Blytheville Hospital							
Camden 7 243—Ouachita	Gen	NP Assn	30	9	128	13	916
Charleston 801—Franklin							
Bollinger Hospital	Gen	Indiv	12		24	2	97
Clarksburg 3 031—Johnson							
Johnson County Hospital	Gen	Corp	18	1	10	2	166
Conway 5 534—Faulkner							
Faulkner County Hospital	Gen	City	16	4	17	4	158
Crossett 2 811—Ashley							
Crossett Hospital	Gen	Corp	50	8	50	15	471
De Queen 2 938—Sevier							
Archer Hospital	Gen	Indiv	20	1	8	10	592
Dyess 1 000—Mississippi							
Dyess Colony Hospital	Gen	Corp	20	4	115	6	288
FI Dorado 16 421—Union							
Henry C Rosamond Memorial Hospital	Gen	Indiv	20	5	22	6	487
Warner Brown Hospital	Gen	Church	69	6	167	40	1,610
Fayetteville 7 394—Washington							
Fayetteville City Hospital	Gen	City	50	6	100	23	1,096
Veterans Admin Facility	Gen	Vet	20		20	2	684
Ft Smith 31 420—Sebastian							
Arkansas Tuberculosis Sanat	Unit of	Arkansas Tuberculosis Sanatorium					
St. Edwards Mercy Hosp	Gen	Church	100	15	207	71	2,788
Sparks Memorial Hospital	Gen	NP Assn	100	7	139	37	2,404
Haskell 180—Saline							
State Hospital Benton Division	Ment	State	1,593				1,471 Trans
		Rated capacity	1,626				
Heber Springs 1 401—Cleburne							
Estelle Hospital	Gen	Part	11	2	25	5	257
Helena 8 816—Phillips							
Helena Hospital	Gen	NP Assn	38	6	72	21	804
Hope 6 000—Hempstead							
Josephine Hospital	Gen	Part	22	3	27	5	280
Julia Chester Hospital	Gen	CyCo	20	4	50	12	750
Hot Springs National Park, 20 238—Garland							
Army and Navy General Hospital	Gen	Fed	528	3	5	375	2,837
Leo N. Levi Memorial Hosp	Gen	Frat	72	3	49	57	72
Ozark Sanatorium	Gen	Corp	60	6	24	8	378
St. Joseph's Hospital	Gen	Church	100	6	60	68	2,190
Jonesboro 10 326—Craighead							
St. Bernard's Hospital	Gen	Church	92	8	139	72	2,441
Lake Village, 1 882—Chicot							
Lake Village Infirmary	Gen	Part	40	5	49	13	847
Little Rock 81 679—Pulaski							
Arkansas Children's Home and Hospital	Chil	NP Assn	60			37	535
Baptist State Hospital	Gen	Church	300	15	263	96	4,174
Granite Mountain Hospital	Gen	Indiv	17	2	20	4	20
Little Rock City Hospital	Gen	City	170	20	70	68	2,037
Missouri Pacific Hospital	Gen	NP Assn	123			46	1,357
St. Vincent's Infirmary	Gen	Church	130	15	406	90	4,023
State Hospital	Ment	State	2,478				2,473
		Rated capacity	2,215				1,371
Monticello 2 076—Drew							
Wack Wilson Hospital	Gen	Indiv	30		40	11	640
Morrilton 4 043—Conway							
St. Anthony's Hospital	Gen	Church	18	4	24	11	381
North Little Rock 19 410—Pulaski							
Veterans Admin Facility	Ment	Vet	1,317				890
Paragould 5 066—Greene							
Dickson Memorial Sanit	Gen	Corp	25	3	20	7	30
Paris 2 234—Logan							
Dr. Jewell's Infirmary	Gen	Indiv	20	2	6	5	145
Pine Bluff 20 760—Jefferson							
Davis Hospital	Gen	Church	50	4	100	25	1,200

## ARKANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Prescott 3 033—Nevada							
Cora Donnell Hospital	Gen	Indiv	30	3	20	13	50
Russellville 5 628—Pope							
St. Mary's Hospital	Gen	Indiv	60	12	80	24	1,119
Searcy 3 387—White							
Wakenight Sanitarium	Gen	Indiv	30	2	24	12	810
State Sanatorium, Logan							
Arkansas Tuberculosis Sanat	TB	State	670			611	910
Tevarkana 10,764—Miller							
Michael Meagher Memorial Hospital	Gen	Church	50	10	167	30	1,813
St. Louis Southwestern Hospital	Indus	NP Assn	100			60	2,307

## Related Institutions

De Queen 2 938—Sevier	Gen	Indiv	20	1	10	6	911
Childress Hospital							
Hot Springs National Park, 20 238—Garland							
New Park Sanitarium and Hospital	Gen	Indiv	25	1			
Public Health Service Medical Center Infirmary	Ven	USPHS	60	3	15	40	1,000
Little Rock 81 679—Pulaski							
Arkansas School for the Blind	Inst	State	12			2	10
Florence Crittenton Home	Mat	NP Assn	30	20	30	3	40
Pulaski County Hospital	Gen	County	90	6	112	70	500
Newport 4 547—Jackson							
Dr. Gray's Sanitarium	Gen	Indiv	8	2	5	2	71
Russellville 5 628—Pope							
Haney Eye Ear Nose and Throat Hospital	ENT	Indiv	10			3	877

## Summary for Arkansas

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	49	10,817	8,690	53,209
Related institutions	8	203	141	2,181
Totals	57	11,020	8,836	55,390
Refused registration	12	260		

## CALIFORNIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Agnew 300—Santa Clara							
Agnews State Hospital	Ment	State	3,105			3,400	1,020
		Rated capacity	3,360				
Ahwahnee, 20—Madera							
Ahwahnee Tri County Tuberculosis Sanatorium	TB	County	118			111	94
Alameda 30 033—Alameda							
Alameda Sanatorium on the South Shore	Gen	Corp	80	21	208	42	1,832
Albany 8 603—Alameda							
Humboldt Hospital	Gen	Part	32	16	367	12	890
Alhambra 29 472—Los Angeles							
Alhambra Hospital	Gen	Corp	40	12	264	23	1,061
Angel Island 4 48—Marin							
Station Hospital	Gen	Army	72			28	1,400
Antioch 3 003—Contra Costa							
Antioch Hospital	Gen	Indiv	15	4	140		618
Arcata 1 709—Humboldt							
Trinity Hospital	Gen	Church	22	4	57	15	893
Arlington 3 440—Riverside							
Riverside County Hospital	G&TB	County	370	10	202	296	3,493
Artesia 3 891—Los Angeles							
Artesia Hospital	Gen	Indiv	20	4	77	10	541
Auberry 100—Fresno							
Wishah Sanatorium	TB	County	102			67	10
Auburn 2 661—Placer							
Highland Hospital	Gen	Indiv	22	6	No data supplied		
Bakersfield 26 010—Kern							
Bakersfield Emergency Hosp	Gen	Indiv	25	4	No data supplied		
Mercy Hospital	Gen	Church	70	20	337	49	4,110
San Joaquin Hospital	Gen	Corp	40	6	No data supplied		
Banning 2 702—Riverside							
Banning Hospital and Sanat	TB	Indiv	20	2	10	171	
Southern Sierras Sanat	TB	Indiv	30		12	9	
Bell 7 884—Los Angeles							
Bell Mission Hospital	Gen	Corp	30	13	374	18	910
Belmont 984—San Mateo							
Alexander Sanitarium	N&M	Corp	50			75	190
California Sanatorium	TB	Corp	50			75	212
Twin Pines Sanitarium	N&M	Corp	50			75	61
Berkeley 82 100—Alameda							
Alta Bates Hospital	Gen	Corp	100	26	80	77	2,867
Berkeley General Hospital	Gen	NP Assn	100	13	22	23	1,011
E. V. Cowell Memorial Hosp	Gen	State	100			40	2,000
Bravley 10 430—Imperial							
Bravley Community Hosp	Gen	Indiv	10	3	40	6	23
Burbank 16 002—Los Angeles							
Burbank Hospital	Gen	Indiv	20	7	10	22	670
Calistoga 1 000—Napa							
Silverado Sanatorium	TB	Indiv	60			41	117
Camarillo 200—Ventura							
Camarillo State Hospital	Ment	State	1,100			1,101	1,771
		Rated capacity	1,420				
Carmel 2 200—Monterey							
Peninsula Community Hosp	Gen	NP Assn	25	9	135	16	877

Key to symbols and abbreviations is on page 986

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Checo 7 061—Butte	Gen	Indiv	14	4	62	10	436
Checo Hospital	Gen	Indiv	52	12		18	360
Enloe Hospital							
Colfax 912—Placer							
Bushnell Sanatorium	Unit of Colfax	School for the Tuberculous					
Colfax Hospital	Unit of Colfax	School for the Tuberculous					
Colfax School for the Tuberculous	TB	Indiv	56			2.5	56
Housekeeping Cottage Colony	Unit of Colfax	School for the Tuberculous					
Colusa 2 116—Colusa	Cen	County	2.5	8	86	16	601
Colusa Memorial Hospital							
Compton 12 510—Los Angeles	N CM	Corp	155			58	338
Compton Sanitarium*	Cen	Corp	30	9	241	17	769
Las Campanas Hospital							
Covina 2 774—Los Angeles	Cen	Part	40	8	138	26	1 060
Covina Hospital							
Crescent City 1 720—Del Norte	Cen	NPA'sen	16	5	47	9	486
Knapp Hospital							
Culver City, 5 669—Los Angeles	Gen	Corp	40	17	84	8	391
University Hospital							
Duarte 1 500—Los Angeles	TB	NPA'sen	1.57			1.52	109
Los Angeles Sanatorium							
Dunsmuir 2 610—Siskiyou	Cen	Corp	17	4	2	8	440
Dunsmuir Hospital and Sanitarium							
El Centro 8 434—Imperial	Gen	County	88	5	116	3.5	1 211
Imperial County Farm and Hospital							
El Monte 3 479—Los Angeles	Gen	NPA'sen	13.5	15	15	114	184
Ruth Home							
Eureka 15 752—Humboldt	Cen	Part	40	8	80	22	824
General Hospital							
Humboldt County Hospital	Cen	County	114	12	101	103	1 478
Humboldt County School for the Tuberculous	TB	County	6.5			52	48
St Joseph Hospital	Cen	Church	63	12	108	40	1 669
Ft Bidwell 467—Modoc	Gen	IA	38	1	2	30	109
Ft Bidwell Hospital							
Ft Bragg 3 022—Mendocino	Gen	Corp	25	5	73	12	377
Redwood Coast Hospital							
French Camp 246—San Joaquin	Gen	County	575	2.5	684	517	9 460
San Joaquin General Hosp							
Fresno 52 513—Fresno	Cen	Corp	12.5	18	3.4	60	3 008
Burnett Sanitarium*							
Fresno County General Hospital**	Cen	County	502	18	714	4.9	80.6
St Agnes Hospital	Gen	Church	6.5	15	39*	48	2.2.0
Fullerton 10 560—Orange							
Fullerton Hospital (St Joseph Hospital)	Cen	Church	2.5	6	10.5	14	512
Gilroy 3 502—Santa Clara	Cen	NPA'sen	26	7	no data supplied		
Wheeler Hospital							
Glendale 62 736—Los Angeles	Cen	Church	200	16	419	1.59	3 431
Glendale Sanitarium and Hospital*							
Physicians and Surgeons Hospital	Gen	Corp	60	20	422	53	1 482
Grass Valley 3 817—Nevada	Cen	Indiv	2.5	4	30	1	746
W C Jones Memorial Hosp							
Hanford 7 028—Kings	Cen	Corp	26	6	98	15	784
Hanford Sanitarium							
Kings County Hospital	Gen	County	1.0	11	134	109	1 574
Sacred Heart Hospital	Gen	Church	17	5	90	8	376
Hawthorne 6 596—Los Angeles	Cen	Indiv	15	5	1.4	13	4.8
Hawthorne Hospital							
Hayward 5 530—Alameda	Gen	Indiv	16	5	7.5	8	361
Hayward Hospital							
Healdsburg 2 96—Sonoma	Gen	Corp	14	7	63	6	
Healdsburg General Hosp							
Hermosa Beach 4 790—Los Angeles	Gen	NPA'sen	15	7	28	7	321
South Bay Community Hospital							
Hollister 3 757—San Benito	Gen	NPA'sen	1.5	5	30	7	440
Hazel Hawkins Memorial Hospital							
Hoopa 90—Humboldt	Gen	IA	36	5	43	18	369
Hoopa Valley Indian Hosp							
Huntington Park 24 591—Los Angeles	Gen	Corp	31	10	243	2.1	1 250
Mission Hospital							
Imola 90—Napa	Ment	State	3 676			3.52.5	944
Napa State Hospital							
Indio 9 000—Riverside	Gen	Indiv	16	4	79	8	681
Coachella Valley Hospital							
Inglewood 19 450—Los Angeles	Gen	Indiv	2.5	10	138	13	78.5
Centinela Hospital							
Keene 164—Kern	TB	County	10.5			96	107
Stony Brook Retreat							
King City 1 483—Monterey	Gen	Indiv	14	2	22	7	247
Community Hospital							
La Crescenta 6 000—Los Angeles	TB	Corp	4.5			20	1.50
Hillcrest Sanatorium							
La Vina—Los Angeles	TB	NPA'sen	51			50	60
La Vina Sanatorium							
Lindsay 38—Tulare	Gen	Part	11	2	50	5	20.5
Lindsay Hospital							
Livermore 3 119—Alameda	TB	County	19.5			176	221
Troy Sanatorium*							
Livermore Sanitarium	N CM	Corp	112			9.5	1.9
St Pauls Hospital	Gen	Indiv	20	3	60	10	312
Veterans Admin Facility	G & TB	Indiv	312			281	4.5
Mod 6, 88—San Joaquin							
Dr Buchanan's Sanitarium	Gen	Indiv	30	6	87	13	42.5
Mason Hospital	Cen	Indiv	1.5	4	23	8	36.5

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Loma Linda 2 500—San Bernardino							
Loma Linda Sanitarium and Hospital*	Gen	Church	112	12	190	90	2 965
Long Beach 142 032—Los Angeles							
Harriman Jones Clinic and Hospital	Gen	Indiv	40	7	80	16	713
Long Beach Community Hospital	Gen	NPA'sen	100	20	422	63	3 273
St Mary's Long Beach Hosp	Gen	Church	100	12	94	19	721
Seaside Memorial Hospital*	Gen	NPA'sen	200	53	1 159	133	5 919
Los Angeles 1 238 048—Los Angeles							
Barlow Sanatorium*	TB	NPA'sen	100			95	64
Baurbyte Maternity Cottage Mat	Gen	NPA'sen	28	30	489	14	493
California Babies Hospital*	Chil	NPA'sen	40	10	54	5	544
California Hospital*	Gen	Church	261	31	1 006	231	8 361
Cedars of Lebanon Hosp **	Gen	NPA'sen	248	40	970	222	7 988
Children's Hospital*	Chil	NPA'sen	15.5			143	4 339
Ex Patients Home of the Jewish Consumptive Relief Association	TB	NPA'sen	65			60	8.5
Eyo and Ear Hospital	LNT	Corp	21			10	1 024
French Hospital	Gen	NPA'sen	80	24	316	44	1 475
Golden State Hospital	Gen	Indiv	69	2	3	40	940
Hospital of the Good Samaritans	Gen	Church	400	45	505	310	9 392
Japanese Hospital	Gen	Corp	36	6	106	23	1 191
Lincoln Hospital	Cen	NPA'sen	32	10	1.9	16	886
Los Angeles County Hospital**	Gen	County	2 837	144	3 207	2 321	53 717
Los Angeles County Psychopathic Hospital	Unit of Los Angeles County Hospital	Indiv	37			34	118
Los Angeles Sanitarium							
Methodist Hosp of Southern California	Gen	Church	150	40	1 257	120	5 52.5
Orthopaedic Hospital*	Orth	NPA'sen	75			71	2 103
Pahl Hospital	Gen	Indiv	1.5	3	87	8	510
Prebyterian Hospital—Olmsted Memorial	Gen	NPA'sen	270	60	870	157	7 175
Queen of Angels Hospital*	Gen	Church	36	6	81.5	190	6 546
St Vincent's Hospital*	Cen	Church	200	50	719	160	6.7
Santa Fe Coast Lines Hospital*	Indus	NPA'sen	1.50			101	2 792
Southwest General Hospital	Gen	Indiv	24	8	146	18	760
White Memorial Hosp**	Gen	Church	174	29	924	121	5 288
Lo Guto 3 168—Santa Clara							
Oak's Sanitarium	TB	Indiv	60			32	70
Madera 4 66—Madera							
Dearborn Hospital	Gen	Indiv	12	4	8.5	10	470
Madera County Hospital	Cen	County	7.5	5	124	72	1 364
Madera Sanitarium	Gen	Indiv	17	5	38	9	492
Manor—Marin							
Arequipa Sanatorium	TB	NPA'sen	4.5			41	80
Varch Field—Riverside							
Station Hospital	Cen	Army	70	6	34	44	1 042
Vare Island 500—Solano							
U S Naval Hospital*	Gen	Navy	500	6	29	32.5	2.53
Martinez 6 569—Contra Costa	Gen	County	190	12	160	179	2 271
Contra Costa County Hosp							
Martinez Community Hosp	Gen	Corp	30	6	104	22	9.5
Marysville 5 763—Yuba							
Rideout Memorial Hospital	Gen	Indiv	30	9	112	21	1 038
Merced 7 066—Merced							
Merced Hospital	Gen	Indiv	50	12	211	34	1 597
Modesto 13 842—Stanislaus							
McPheeters Hospital	Gen	Indiv	34	6	8.5		1 047
Robertson Hospital	Gen	Indiv	33	8	13.5	18	1 107
St Mary's Hospital	Gen	Church	22	8	201	20	809
Stanislaus County Hospital	Gen	County	194	12	2.50	1.2	30.9
Monrovia 10 890—Los Angeles							
Norumbega Sanatorium	TB	Indiv	20			14	71
Pottenger Sanatorium and Clinic*	TB	Corp	120			83	110
Monterey 9 141—Monterey							
Monterey Hospital	Cen	NPA'sen	49	6	42	1.5	5.8
Station Hospital	Cen	Army	60	2	5	47	1 787
Monterey Park 6 406—Los Angeles							
Garfield Hospital	Gen	Corp	30	8	240	22	967
Murphys 600—Calaveras							
Bret Harte Sanatorium	TB	County	179			142	202
Napa 6 437—Napa							
Victory Hospital	Gen	Corp	28	6	104	12	635
National City 7 301—San Diego							
Flavin Hospital	Gen	Part	12	2	8	2	100
Paradise Valley Sanitarium and Hospital*	Gen	Church	100	16	170	47	1 77.5
Newhall 1 101—Los Angeles							
Wildwood Sanatorium	Unit of Olive View Sanatorium						
Newman 1 269—Stanislaus	Gen	Indiv	11	3	46	7	252
Newman Hospital							
Norwalk 5 111—Los Angeles	Ment	State	2 774			2 440	1 125
Norwalk State Hospital							
Oakland 284 063—Alameda							
Alameda County Hosp**	Gen	County	30.5	22	768	327	10 797
Children's Hospital of the East Bay*	Chil	NPA'sen	6.5			28	1 882
East Oakland Hospital	Gen	Corp	80	20	934	62	3 250
Peralta Hospital	Gen	NPA'sen	141	40	79	112	5 379
Providence Hospital*	Cen	Church	19	20	5.3		4 093
Samuel Merritt Hospital*	Gen	NPA'sen	164	20	734	125	4 92.2
Olive View—Los Angeles							
Olive View Sanatorium*	TB	County	9.9			9.9	709
Orange 8 066—Orange							
Orange County Hospital*	Gen	County	72	21	207	2.2	7 496
St Joseph Hospital*	Cen	Church	100	2.5	56.5	64	2 761

Key to symbols and abbreviations is on page 986

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Oxnard 6280—Ventura	Gen	Church	26	9	118	10	633
St. John's Hospital	Gen	Church	26	9	118	10	633
Palo Alto 10632—Santa Clara	Gen	NPA	80	20	236	50	2866
Palo Alto Hospital	Gen	NPA	80	20	236	50	2866
Veterans Admin Facility	Gen	NPA	1067			1082	299
Pasadena 76086—Los Angeles	Gen	NPA	174	24	364	137	5661
Collins P and Howard Hunt	Gen	NPA	80			74	336
Ington Memorial Hosp**	Gen	Church	30	18			1937
Las Encinas Sanitarium	Gen	Church	70	22	381	63	2108
Lutheran Good Samaritan	Gen	NPA	14	14	236	6	260
St. Luke's Hospital	Gen	Church	70	22	381	63	2108
Woman's Hospital	Gen	NPA	14	14	236	6	260
Patton 4100—San Bernardino	Gen	NPA	3789			3934	1333
Patton State Hospital	Gen	NPA	3789			3934	1333
Placerville 2322—Eldorado	Gen	Part	23	8	36	13	484
Placerville Sanatorium	Gen	Part	23	8	36	13	484
Pomona 20804—Los Angeles	Gen	NPA	82	21	20	29	1210
Pomona Valley Community	Gen	NPA	82	21	20	29	1210
Hospital	Gen	NPA	82	21	20	29	1210
Portola 1460—Plumas	Gen	NPA	30	5	79	13	584
Western Pacific Railway	Gen	NPA	30	5	79	13	584
Hospital	Gen	NPA	30	5	79	13	584
Red Bluff 3117—Tehama	Gen	Church	23	6	100	10	510
St. Elizabeth's Mercy Hosp	Gen	Church	23	6	100	10	510
Tehama County Hospital	Gen	County	75	6	83	52	708
Redwood City 8962—San Mateo	Gen	Indiv	70			31	62
Canyon Sanatorium	Gen	Cy Co	90			89	121
Hassler Health Home	Gen	Cy Co	90			89	121
Richmond 20093—Contra Costa	Gen	Part	39	11	212	29	1398
Richmond Cottage Hospital	Gen	Part	39	11	212	29	1398
Riverside 29006—Riverside	Gen	NPA	54	18	331	50	1672
Riverside Community Hosp	Gen	NPA	54	18	331	50	1672
Sherman Institute Hospital	Gen	IA	58			11	536
Rosemead 4300—Los Angeles	Gen	NPA	20			8	61
Rosemead 4300—Los Angeles	Gen	NPA	20			8	61
Alhambra Sanatorium	Gen	NPA	20			8	61
Lovel Sanatorium for Chil	Gen	NPA	20			8	61
San Bernardino 37481—San Bernardino	Gen	Church	123	12	230	37	1333
San Bernardino County	Gen	County	307	18	468	278	3961
San Diego 14799—San Diego	Gen	Indiv	16	9	172	8	704
Good Samaritan Hospital	Gen	Church	220	30	1744	230	9823
Mercy Hospital	Gen	Church	220	30	1744	230	9823
San Diego County General	Gen	County	631	32	749	470	8909
Hospital**	Gen	NPA	44	6	50	29	936
Scripps Memorial Hospital	Gen	NPA	24			24	993
Scripps Metabolic Clinic	Gen	NPA	24			24	993
U S Naval Hospital	Gen	Navy	1000			806	6777
Vaughan Home	Gen	NPA	1000			806	6777
San Fernando 7367—Los Angeles	Gen	NPA	214			232	302
Veterans Admin Facility	Gen	NPA	214			232	302
San Francisco 64394—San Francisco	Gen	NPA	134	10	118	116	7846
Chinese Hospital	Gen	NPA	134	10	118	116	7846
Dante Hospital	Gen	NPA	236	18	312	147	4421
Franklin Hospital	Gen	NPA	210	10	238	188	3088
French Hospital	Gen	Part	31			10	1018
Greens Fyo Hospital	Gen	NPA	200	46	998	128	5661
Hospital for Children**	Gen	NPA	600	10	107	327	5033
Letterman General Hosp*	Gen	Army	118	27	545	98	4141
Mary's Help Hospital**	Gen	Church	163	26	372	112	4012
Mt Zion Hospital**	Gen	NPA	33			23	791
Park Sanitarium	Gen	NPA	33			23	791
St. Elizabeth's Infant Hos	Gen	Church	23	16	31	14	61
St. Francis Hospital	Gen	NPA	200	63	676	174	8109
St. Joseph's Hospital	Gen	Church	200	63	676	174	8109
St. Luke's Hospital**	Gen	Church	260	26	417	160	4417
St. Mary's Hospital	Gen	Church	253	40	94	22	749
San Francisco Hospital**	Gen	Cy Co	1711	35	322	1031	1376
Shriners Hospital for Crip	Gen	Orth	60			60	296
pled Children**	Gen	Orth	60			60	296
Southern Pacific General	Gen	NPA	400			297	5143
Hospital*	Gen	NPA	400			297	5143
Stanford Univ Hospital	Gen	NPA	298	26	733	246	937
(Including Lane Hosp)**	Gen	NPA	298	26	733	246	937
Sutter Hospital	Gen	Corp	475			414	4066
U S Marine Hospital	Gen	NPA	475			414	4066
Univ of California	Gen	State	230	30	310	200	6787
Hospital**	Gen	State	230	30	310	200	6787
Veterans Admin Facility	Gen	NPA	230	30	310	200	6787
San Jacinto 1746—Riverside	Gen	IA	24	3	23	2	31
Soboba Indian Hospital	Gen	IA	24	3	23	2	31
San Jose 7701—Santa Clara	Gen	Corp	40			73	109
Alum Rock Sanatorium	Gen	Corp	40			73	109
O'Connor Sanitarium	Gen	Church	103	23	40	73	109

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
San Jose Hospital	Gen	NPA	130	24	131	82	3440
Santa Clara County Hos	Gen	NPA	411	28	393	890	6111
Santa Clara County Sanat	Gen	NPA	411	28	393	890	6111
San Leandro 11433—Alameda	Gen	NPA	124			92	119
Fairmont Hospital of Ala	Gen	NPA	124			92	119
meda County**	Gen	NPA	124			92	119
San Luis Obispo 8276—San Luis Obispo	Gen	NPA	837			793	2031
Mountain View Hospital	Gen	NPA	837			793	2031
San Luis Obispo Hosp	Gen	NPA	837			793	2031
San Luis Obispo Hosp	Gen	NPA	837			793	2031
San Mateo 13444—San Mateo	Gen	NPA	837			793	2031
Community Hospital of San	Gen	NPA	837			793	2031
Mateo County	Gen	NPA	837			793	2031
Mills Memorial Hospital	Gen	NPA	837			793	2031
San Pedro—Los Angeles	Gen	NPA	837			793	2031
San Pedro Hospital	Gen	NPA	837			793	2031
Station Hospital	Gen	NPA	837			793	2031
U S Ship Relief	Gen	NPA	837			793	2031
San Rafael 8022—Marin	Gen	NPA	837			793	2031
San Rafael Cottage Hosp	Gen	NPA	837			793	2031
Station Hospital	Gen	NPA	837			793	2031
Santa Barbara 33613—Santa Barbara	Gen	NPA	837			793	2031
St. Francis Hospital*	Gen	NPA	837			793	2031
Santa Barbara Cottage	Gen	NPA	837			793	2031
Hospital**	Gen	NPA	837			793	2031
Santa Barbara General Hos	Gen	NPA	837			793	2031
pital*	Gen	NPA	837			793	2031
Santa Cruz 14393—Santa Cruz	Gen	NPA	837			793	2031
Hanly Hospital	Gen	NPA	837			793	2031
Santa Cruz County Hosp	Gen	NPA	837			793	2031
Santa Cruz Hospital	Gen	NPA	837			793	2031
Santa Monica 37146—Los Angeles	Gen	NPA	837			793	2031
St. Catherine's Hospital	Gen	NPA	837			793	2031
Santa Monica Hospital	Gen	NPA	837			793	2031
Wilshire Hospital	Gen	NPA	837			793	2031
Santa Rosa 10636—Sonoma	Gen	NPA	837			793	2031
Eliza Tanner Hospital	Gen	NPA	837			793	2031
General Hospital	Gen	NPA	837			793	2031
Scottia 1000—Humboldt	Gen	NPA	837			793	2031
Scottia Hospital	Gen	NPA	837			793	2031
Selma 3047—Fresno	Gen	NPA	837			793	2031
Selma Sanitarium	Gen	NPA	837			793	2031
Sonoma 2285—Tulumbne	Gen	NPA	837			793	2031
Sonoma Hospital	Gen	NPA	837			793	2031
South Gate 19632—Los Angeles	Gen	NPA	837			793	2031
Suburban Hospital	Gen	NPA	837			793	2031
South Pasadena 13730—Los Angeles	Gen	NPA	837			793	2031
Pasadena Sanitarium	Gen	NPA	837			793	2031
South San Francisco 6197—San Mateo	Gen	NPA	837			793	2031
South San Francisco Hosp	Gen	NPA	837			793	2031
Spadra 27—Los Angeles	Gen	NPA	837			793	2031
Pacific Colony—State Nar	Gen	NPA	837			793	2031
cotic Hospital	Gen	NPA	837			793	2031
MedeDrug State	Gen	NPA	837			793	2031
Rated capacity 720	Gen	NPA	837			793	2031
Springville 665—Tulare	Gen	NPA	837			793	2031
Tulare Kings Counties Joint	Gen	NPA	837			793	2031
Tuberculosis Hospital	Gen	NPA	837			793	2031
Stockton 47063—San Joaquin	Gen	NPA	837			793	2031
Dameron Hospital	Gen	NPA	837			793	2031
St. Joseph's Home and Hos	Gen	NPA	837			793	2031
pital	Gen	NPA	837			793	2031
Stockton State Hospital	Gen	NPA	837			793	2031
Rated capacity 3101	Gen	NPA	837			793	2031
Susanville 1338—Lassen	Gen	NPA	837			793	2031
Riverside Hospital	Gen	NPA	837			793	2031
Tahoe 330—Mendocino	Gen	NPA	837			793	2031
Mendocino State Hospital*	Gen	NPA	837			793	2031
Rated capacity 2123	Gen	NPA	837			793	2031
Tehachapi 76—Kern	Gen	NPA	837			793	2031
Tehachapi Valley Hospital	Gen	NPA	837			793	2031
Torrance 7271—Los Angeles	Gen	NPA	837			793	2031
Jared Sidney Torrance Me	Gen	NPA	837			793	2031
morial Hospital	Gen	NPA	837			793	2031
Troms 77—San Bernardino	Gen	NPA	837			793	2031
Troms Ho pital	Gen	NPA	837			793	2031
Tulare 6207—Tulare	Gen	NPA	837			793	2031
Bellevue Hospital	Gen	NPA	837			793	2031
Tulare County Gen Ho p	Gen	NPA	837			793	2031
Tulare Hospital	Gen	NPA	837			793	2031
Turlock 426—Stanislaus	Gen	NPA	837			793	2031
Emanuel Hospital	Gen	NPA	837			793	2031
Lillian Collins Hospital	Gen	NPA	837			793	2031
Upland 4715—San Bernardino	Gen	NPA	837			793	2031
San Antonio Community	Gen	NPA	837			793	2031
Hospital	Gen	NPA	837			793	2031
Ventura 11432—Ventura	Gen	NPA	837			793	2031
Foster Memorial Hospital	Gen	NPA	837			793	2031
Ventura County Ho pital	Gen	NPA	837			793	2031
Vineburg 164—Sonoma	Gen	NPA	837			793	2031
Burdale Ho pital	Gen	NPA	837			793	2031
Villa 761—Tulare	Gen	NPA	837			793	2031
Village Municipal Hospital	Gen	NPA	837			793	2031
Watsonville 8344—Santa Cruz	Gen	NPA	837			793	2031
Watsonville Ho pital	Gen	NPA	837			793	2031
Ward 4000—Sierrita	Gen	NPA	837			793	2031
Ward Ho pital	Gen	NPA	837			793	2031
Wilmar 30—Placer	Gen	NPA	837			793	2031
Wilmar Joint Sanatorium	Gen	NPA	837			793	2031
West Los Angeles—Los Angeles	Gen	NPA	837			793	2031
Veteran Admin Facility	Gen	NPA	837			793	2031
Westwood 200—Lassen	Gen	NPA	837			793	2031
Westwood Ho pital	Gen	NPA	837			793	2031

Key to symbols and abbreviations is on page 986

CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Willits 1474—Mendocino Hospital	Gen	NPAsn	23	5	63	18	583
Woodland 542—Solo Woodland Clinic Hospital	Gen	Part	63	10	131	37	1 677
Yosemite National Park 1 000—Mariposa Lewis Memorial Hospital	Gen	Indiv	12	2	15	8	360
Yreka 2 126—Siskiyou Siskiyou County Gen Hosp	Gen	County	130	7	140	12	1 336
Yuba City 3 600—Sutter Yuba City General Hospital	Gen	Indiv	18	6	131	12	883
Related Institutions							
Alcatraz—San Francisco U S Penitentiary Hosp	Gen	Fed	33			11	129
Alta Loma 1 000—San Bernardino Our Lady of Lourdes Sanat	TB	Indiv	20			8	20
Artesia 3 831—Los Angeles Pioneer Sanitarium	Ment	Part	33				
Atwater 91—Merced Bless Memorial Hospital	TbChil	County	32			38	99
Auburn 9 601—Placer Placer County Hospital	InstGen	County	130	3	74	112	823
Azusa 4 808—Los Angeles Rural Rest Home and Sanit	Conv	NPAsn	56			43	112
Belmont 984—San Mateo Chas S Howard Founda tion	TbChil	NPAsn	20				
Bishop 1 159—Inyo Mono Basin Hospital	Indus	City	13			6	128
Blythe 1 020—Riverside Blythe Hospital	Gen	County	13	6	36	6	849
Claremont 2 259—Los Angeles Claremont Colleges Infirm	Inst	NPAsn	24			6	304
Coronado 5 493—San Diego Coronado Hospital	Gen	Indiv	12	5	47	4	283
Culver City 3 669—Los Angeles Community Hospital	Gen	Indiv	12	4	102	6	360
Delano 2 632—Kern Delano Hospital	Gen	Indiv	11	4	42	6	
Dos Palos 1 000—Merced Dos Palos Community Hosp	Gen	NPAsn	12	3		Estab	1937
Duarte 1 000—Los Angeles Mulrose Sanatorium	TB	Indiv	24			18	63
Eldridge 16—Sonoma Santa Teresa Sanat	TB	Church	72			70	102
Eldridge 16—Sonoma Sonoma State Home	MeDe	State	2 614			2 661	419
			Rated capacity 2 430				
Eureka 10 702—Humboldt Humboldt County Isolation Hospital	Isol	County	16			6	166
Fowler 1 171—Fresno Fowler Sanitarium	Gen	Indiv	5	3	22	2	92
Glendale 62 736—Los Angeles Villa Shaw Rest Home	N&M	Indiv	36			34	12
Hollister 3 757—San Benito San Benito County Hosp	InstGen	County	34	1		No data supplied	
Hondo 3 130—Los Angeles Rancho Los Amigos	Ment	County	2 820			2 703	1 906
Inglewood 19 450—Los Angeles St Erno Sanitarium	N&M	Indiv	140			100	190
Keene 164—Kern Kern County Preventorium	TbChil	County	44			41	76
Kingsburg 1 372—Fresno Kingsburg Sanitarium	Gen	Indiv	9	2	33	6	234
La Crescenta 600—Los Angeles Kimball Sanitarium	N&M	Part	28			18	49
Lancaster 1 600—Los Angeles Antelope Valley Sanatorium and Hospital	TB	Part	118				
Lincoln 9 694—Placer Joslin Sanatorium	N&M	Indiv	13			9	12
Livermore 3 119—Alameda Del Valle Preventorium	Conv	County	83			72	187
Los Angeles 1 238 048—Los Angeles Chase Diet Sanitarium	Conv	Indiv	22			13	162
Dougherty Sanatorium	TB	Indiv	14			12	76
Florence Crittendon Home	Mat	NPAsn	30	20	69	26	81
Home for Children	Conv	NPAsn	94			20	92
Juvenile Hall Hospital	GenVen	County	121			87	4 044
Las Palmas Rest Home	Nerv	Indiv	20			18	29
Los Angeles Smallpox Quarantine Hospital	Isol	City	90			1	18
Reithaven	N&M	NPAsn	40			23	133
St Barnabas Rest Home for Men	Conv	Church	13			12	109
Salvation Army Women's Home and Hospital	Mat	Church	60	40	170	46	916
Twentieth Century Sanit	N&M	Indiv	33			Estab	191
Los Banos 1 833—Merced Los Banos Hospital	Gen	Indiv	14	4	38	33	363
Loyalton 3 7—Sierra Sierra Valley Hospital	Gen	Indiv	7	1	4	3	73
Manteca 1 614—San Joaquin Manteca Hospital	Gen	Part	8	4			
Marysville 3 703—Yuba Yuba County Hospital	InstCen	County	70	10	114	68	700
Merced 1 000—Merced Merced General Hospital	InstCen	County	230	11	308	231	3 348
Monrovia 10 000—Los Angeles Canyon Preventorium	TB	NPAsn	90			80	78
Mayknoll Sanatorium	TB	Church	23			20	20
Palm Grove Sanatorium	N&M	Part	40			38	33

CALIFORNIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Montebello 5 498—Los Angeles Los Angeles Convalescent Home	Conv	NPAsn	42			30	499
Nevada City 1 701—Nevada Nevada City Sanitarium	Gen	Indiv	12	8	119	5	343
Nevada County Hospital	Inst	County	100			70	160
Oakland 284 063—Alameda El Reposo Sanitarium	Conv	Indiv	18			8	245
Salvation Army Women's Home and Hospital	Mat	Church	63	30	170	50	170
Pacific Grove 5 538—Monterey Pine Grove Sanitarium	Gen	Indiv	16	2	3	2	45
Pacifica 1 012—Los Angeles Independent Order of Foresters California Tuberculosis Sanitarium	TB	Frat	76			No data supplied	
Pasadena 76 056—Los Angeles Pasadena Preventorium	Conv	NPAsn	40			40	73
Placerville 2 322—Eldorado Eldorado County Hospital	InstGen	County	55	2	8	40	60
Porterville 5 303—Tulare Mt Whitney Hospital	Gen	Indiv	8	2	12	1	23
Randsburg 443—Kern Rand District Hospital	Gen	Indiv	10	4	31	7	683
Redding 4 188—Shasta Shasta County Hospital	InstGen	County	56	6	67	39	727
Represa 30—Sacramento Folsom Prison Hospital	Inst	State	84			64	
Rosemead 4 500—Los Angeles Rosemead Lodge	N&M	Indiv	68			38	148
Rose 1 355—Marin The Cedars School for Nervous and Retarded Children	MeDe	Indiv	37			32	7
San Andreas 775—Calaveras San Andreas Hospital	Gen	Indiv	8	2	5	2	94
San Diego 147 993—San Diego Hillcrest Home	Conv	Indiv	30			23	44
Lane Sanitarium	Conv	Indiv	8			7	33
San Fernando 7 367—Los Angeles Pauling Rest Home	TB	County	33			43	117
San Fernando Hospital	Gen	Indiv	12	3			
San Francisco 634 394—San Francisco Garden Nursing Home	Inc	NPAsn	60			55	96
Greer Home	Conv	Corp	23			17	73
Laguna Honda Home Infirm	Inst	CyCo	760			639	1 215
San Francisco Polyclinic	Gen	NPAsn	12			7	560
San Gabriel 7 224—Los Angeles Baldy View Sanitarium	N&M	Part	73			73	104
Mission Lodge Sanitarium	N&M	Indiv	60			60	66
San Jose 37 631—Santa Clara Beale Convalescent Home	N&M	Indiv	12			9	41
Sunnyholme Preventorium	Unit of Santa Clara County Hospital						
San Mateo 13 444—San Mateo Nerve Rest	N&M	Indiv	10				
San Mateo Preventorium	TB	NPAsn	28			18	42
San Quentin 328—Marin Charles L Neumiller Hosp	Inst	State	200			130	1 363
San Rafael 8 092—Marin Marin County Tuberculosis Hospital	TB	County	88			16	100
Santa Barbara 33 613—Santa Barbara La Loma Feliz	CardCh	NPAsn	20			9	20
Santa Maria 7 037—Santa Barbara Airport Hospital	Gen	Indiv	16	6	50	11	541
Santa Monica 37 146—Los Angeles Santa Monica Diet Home	Conv	Indiv	6			5	37
Santa Rosa 10 636—Sonoma Sonoma County Hospital	InstGen	County	319	29	144	270	2 091
Sonoma 2 278—Tulolumne Tulolumne County Hosp	InstGen	County	32	4	34	25	574
Stanford University 720—Santa Clara Stanford Convalescent Home	Chil	NPAsn	80			78	215
Suisun City 90—Solano Solano County Hospital	InstGen	County	110	8	89	94	843
Sunland—Los Angeles Sunland Sanatorium	TB	Corp	60			53	93
Tracy 3 829—San Joaquin West Side Hospital	Gen	Indiv	8	5	24	3	103
Verdugo City 1 60—Los Angeles Rockhaven Sanitarium	N&M	Indiv	100			73	
Veterans Home—Napa Veterans Home Hospital	Inst	State	236			193	1 730
Waterman—Amador Preston School of Industry Hospital	Inst	State	30			12	1 000
Weaverville 6 0—Trinity Trinity County Hospital	InstGen	County	23			No data supplied	
Willows 2 024—Glenn Glenn County Hospital	InstGen	County	43	2	14	26	308
Wilmar—Los Angeles Jean G McCracken Home	N&M	NPAsn	32				0
Yuba City 3 605—Sutter Yuba City Hospital	InstGen	County	60	7	118	49	579
Summary for California							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	271	1 582	9 017	574 194			
	93	10 677	9 291	37 668			
Totals	364	12 259	59 408	607 862			
Refused registration	74	2 883					



## COLORADO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Alamosa 5107—Alamosa Lutheran Hospital	Gen	Church	20	5	91	18	918
Aspen 700—Pitkin Citizens Hospital	Gen	NP Assn	20	2	7	7	63
Boulder 11223—Boulder Hospital and Sanatorium	Gen	Church	101	6	49	39	1243
Community Hospital	Gen	NP Assn	45	8	116	24	1019
Brush 2312—Morgan Eben Ezra Hospital	Gen	Church	24	8	74	13	547
Canon City 5938—Fremont Colorado Hospital	Gen	Indiv	24	5		4.0	
Fremont County Doctors Hospital	Gen	Corp	21	5	35		510
Cheyenne Wells 590—Cheyenne Cheyenne County Hospital	Gen	Indiv	9	3	24	5	416
Colorado Springs 33237—El Paso Beth El General Hosp	Gen	Church	104	15	406	99	2347
Colorado Springs Psychopathic Hospital	N&M	Part	150			122	106
Cragmor Sanatorium	TB	NP Assn	150			27	56
Crestone Heights Sanitarium and Hospital	Gen	Indiv	38	6	64	6	810
Glockner Sanatorium and Hospital	G&TB	Church	100	13	169	110	1698
National Methodist Episcopal Sanatorium for Tuberculosis	TB	Church	50			37	59
Observation Hospital	Unit of Beth El General Hospital						
St Francis Hospital and Sanatorium	G&TB	Church	140	9	106	84	1140
Union Printers Home and Tuberculosis Sanatorium	TB	NP Assn	74			68	50
Cortez 921—Montezuma Johnson Hospital	Gen	Indiv	14	2	39	8	4.2
Cripple Creek 1427—Teller Cripple Creek Hospital	Gen	NP Assn	25	6	42	5	338
Del Norte 1410—Rio Grande St Joseph's Hospital and Sanatorium	Gen	Church	40	12	70	21	646
Delta 2938—Delta Western Slope Memorial Hospital	Gen	NP Assn	11	3	20	5	193
Denver 287861—Denver Bethesda Sanatorium	TB	Church	68			28	33
Beth Israel Hospital	Gen	NP Assn	55	10	49	29	1206
Childrens Hospital	Chil	NP Assn	200			142	3068
Colorado General Hosp	Gen	State	161	19	447	139	3538
Colorado Psychopathic Hospital	Ment	State	76			79	866
Denver General Hospital	Gen	Rated capacity	78				
Ex Patients Tubercular Home	TB	CyCo	536	51	585	321	17304
Fitzsimons General Hospital	TB	NP Assn	72				28
Mersey Hospital	Gen	Church	200	25	518	160	6081
Mt Alby Sanitarium	N&M	Corp	66			47	436
National Jewish Hospital	TB	NP Assn	200			244	198
Porter Sanitarium and Hosp	Gen	Church	100	20	202	47	1360
Presbyterian Hospital	Gen	Church	150	25	630	100	5093
St Anthony Hospital	Gen	Church	154	30	606	130	2981
St Joseph's Hospital	Gen	Church	260	20	569	183	5000
St Luke's Hospital	Gen	Church	219	30	676	172	6764
Sands House	TB	NP Assn	47			37	
Steele Memorial Hospital	Inf	CyCo	85			23	1581
Durango 400—LaPlata Mercy Hospital	Gen	Church	50	8	141	34	1620
Edgewater 1473—Jefferson Craig Colony	TB	NP Assn	51			44	26
Englewood 7980—Arapahoe Swedish National Sanat	TB	NP Assn	80			61	98
Fairplay 221—Park Fairplay Hospital	Gen	Part	14	2	36	7	401
Ft Logan 500—Arapahoe Station Hospital	Gen	Army	40			38	1060
Ft Lyon 1150—Bent Veterans Admin Facility	Ment	Vet	643			557	149
Ft Morgan 4423—Morgan Ft Morgan Hospital	Gen	Indiv	25	6	85	7	661
Glenwood Springs 102—Garfield Dr Porter's Hospital	Gen	Indiv	20	2	23	12	481
Grand Junction 10247—Mesa St Mary's Hospital	Gen	Church	60	12	128	30	1041
Creeley 12203—Weld Greeley Hospital	Gen	County	85	15	371	74	2940
Hayden 554—Routt Solandt Memorial Hospital	Gen	NP Assn	15	3	33	3	116
Holyoke 1236—Phillips Holyoke Hospital	Gen	Indiv	10	2	7	6	255
Ignacio 404—LaPlata Edward T Taylor Hospital	Gen	IA	37	4	15	14	444
La Junta 7107—Otero T & S F Railroad Hosp	Indus	NP Assn	30			24	500
Mennonite Hospital and Sanitarium	G&TB	Church	70	10	164	44	1167
Lamar 4237—Prowers Charles Maxwell Hospital	Gen	NP Assn	50	6	40	25	633
Leadville 377—Lake St Vincent Hospital	Gen	Church	36	9	18	18	465
Longmont 6027—Boulder Longmont Hospital	Gen	Indiv	33	7	62	16	677
Montrose 3566—Montrose Montrose Hospital	Gen	Indiv	20	5	25	5	207
St Luke's Hospital	Gen	Indiv	14	4	53	9	265

## COLORADO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Oak Creek 1211—Routt Oak Creek Hospital	Gen	Indiv	10	2	2	4	10
Red Cross Hospital	Gen	Indiv	12	12	9	6	241
Ouray 707—Ouray Bates Hospital and Sanit	Gen	Indiv	16	3	10	6	471
Pueblo 6006—Pueblo Colorado State Hospital	Ment	State	3688			3517	60
Corwin Hospital	Gen	Rated capacity	2640				
Parkview Hospital	Gen	NP Assn	220	23	229	117	240
St Mary Hospital	Gen	NP Assn	100	12	129	48	1677
Woodcroft Hospital	Gen	Church	150	15	200	93	2000
Rocky Ford 3426—Otero Physicians Hospital	Gen	NP Assn	130			56	106
Salida 506—Chaffee Denver and Rio Grande West	Gen	NP Assn	80	4	4	51	1520
St Mary Hospital	Gen	NP Assn	40	3	12	14	500
Spivak 300—Jefferson Sanatorium of the Jewish Consumptives Relief Society	TB	NP Assn	300			226	100
Steamboat Springs 1198—Routt Steamboat Springs Hospital	Gen	Indiv	10	2	No data supplied		
Sterling 7195—Logan Good Samaritan Hospital	Gen	Church	30	10	101	18	699
St Benedict Hospital	Gen	Church	35	6	133	16	863
Towaoc 50—Montezuma Ute Mountain Indian Hosp	Gen	IA	24	4	10	11	208
Trinidad 11732—Las Animas Mt San Rafael Hospital	Gen	Church	63	7	140	60	1043
Walsenburg 5503—Huerfano Lamme Brothers Hospital	Gen	Part	20	2	17	9	300
Wheat Ridge 500—Jefferson Evangelical Lutheran Sanit	TB	Church	110				66
Woodmen 400—El Paso Modern Woodmen of America Sanatorium	TB	Frat	245			88	100
Related Institutions							
Alamosa 5107—Alamosa Cornum Hospital	Gen	Indiv	12	6	55	8	379
Boulder 11223—Boulder Boulder County Hospital	Inst	Gen	40	5	41	39	677
Mesa Vista Sanatorium	TB	Part	40			19	27
Burlington 1280—Kit Carson Burlington Hospital	Gen	Part	7	3	17	5	204
Canon City 5938—Fremont Colorado State Penitentiary	Inst	State	40			30	1300
Collbran 341—Mesa Plateau Valley Congrega	Gen	Church	16	4	21	5	227
Denver 287861—Denver Costello Home	TB	Frat	16			9	5
Florence Crittenton Home (Mary H Donaldson Women's Hospital)	Mat	NP Assn	92	14	81	50	107
Oakes Home Sanitarium	TB	Church	150			13	37
St Francis Sanatorium	TB	Church	16				
Salvation Army Women's Home and Hospital	Mat	Church	38	19	78	30	122
Englewood 7980—Arapahoe Temple Sanatorium	TB	Conv	36			36	001
Flagler 540—Kit Carson Flagler Hospital	Gen	Indiv	9	4			Estab 1937
Fruita 1003—Mesa Fruita Community Hospital	Gen	Indiv	8	2	15	3	119
Golden 2426—Jefferson Hospital State Industrial School for Boys	Inst	State	25			7	433
Grand Junction 10247—Mesa State Home and Training School for Mental Defectives	MeDe	State	360			30	86
Greeley 12203—Weld Island Grove Hospital	Inst	County	70			62	178
Homelake 220—Rio Grande Colorado State Soldiers and Sailors Home	Inst	State	30			15	56
Longmont 6020—Boulder St Anna Hospital	Gen	Indiv	12	5	20	9	200
Loveland 3506—Larimer Loveland Hospital and Clinic	Gen	Part	10	4	23	6	251
Monte Vista 2610—Rio Grande Monte Vista Hospital	Gen	Indiv	9	3	37	6	206
Ridge 207—Jefferson State Home and Training School for Mental Defectives	MeDe	State	200			200	82
Yuma 1260—Yuma Lutheran Deaconess Hosp	Gen	Church	10	4	52	2	000
Summary for Colorado							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	22	1,214	927	101,200			
Total	109	12,471	10,107	100,000			
Refused registration	24	450					

Key to symbols and abbreviations is on page 986

## CONNECTICUT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Bridgeport 146 716—Fairfield Bridgeport Hospital*o	Gen	NPAssn	326	74	1,493	271	10,730
Englewood Hospital	TbIso	City	150			68	930
St Vincent's Hospital*o	Gen	Church	215	35	875	152	5 983
Bristol 28 451—Hartford Bristol Hospital	Gen	NPAssn	103	22	364	82	2 249
Canaan 565—Litchfield Robert O Geer Memorial Hospital	Gen	NPAssn	20	13	50	10	341
Cromwell 2,814—Middlesex Cromwell Hall	Gen	Corp	33			18	96
Danbury 22 261—Fairfield Danbury Hospital*o	Gen	NPAssn	115	23	426	94	3 264
Derby 10 788—New Haven Griffin Hospital	Gen	NPAssn	82	19	309	61	2 216
Greens Farms 275—Fairfield Hall Brooke Sanitarium	N&M	Corp	70			43	105
Greenwich 5 981—Fairfield Blythwood	N&M	Corp	79			57	123
Greenwich Hospitalo	Gen	NPAssn	100	24	305	87	2 980
Hartford 164 02—Hartford Avery Convalescent Hosp	Unit of the Hartford Hospital					274	263
Cedarcrest Sanatorium	TB	State	287			536	17 556
Hartford Hospital*o	Gen	NPAssn	692	81	2 186	49	1 790
Mt Sinai Hospital	Gen	NPAssn	60	10	208	156	5 400
Municipal Hospitalso**	GenIso	City	310	25	206	273	667
Neuro Psychiatric Institute of the Hartford Retreat	N&M	NPAssn	270			300	10 001
St Francis Hospital*o	Gen	Church	396	100	1 327	37	86
Wildwood Sanatorium	TB	NPAssn	50				
Manchester 21 93—Hartford Manchester Memorial Hosp	Gen	NPAssn	50	11	228	65	1 768
Meriden 38 481—New Haven Meriden Hospital*o	Gen	NPAssn	116	24	483	71	2 097
Undercliff Meriden State Tuberculosis Sanatorium	TbChil	State	202			219	147
Middletown 24 004—Middlesex Connecticut State Hosp*o	Ment	State	3 294			3 132	941
Middlesex Hospital*o	Gen	NPAssn	130	20	481	103	3 433
Milford 12 600—New Haven Milford Hospital	Gen	NPAssn	50	15	90	18	601
New Britain 68 125—Hartford New Britain General Hosp*o	Gen	NPAssn	210	40	863	180	5 600
New Haven 162 655—New Haven Dr J H Evans Private Hospital	Gen	Indiv	8	4	17	4	104
Grace Hospital*o	Gen	NPAssn	243	44	874	181	6 721
Hospital of St Raphael*o	Gen	Church	237	40	771	183	6 810
New Haven Hospital*o	Gen	NPAssn	458	42	829	374	8 335
Newington 4 572—Hartford Newington Home for Crippled Children	Orth	NPAssn	200			197	110
Veterans Admin Facility	Gen	Vet	265			217	1 912
New London 29 640—New London Home Memorial Hospital	Gen	NPAssn	48	12	163	38	1 387
Lawrence and Memorial As sociated Hospitalso	Gen	NPA ss	201	36	530	131	3 816
Dr Lena's Surgical Hosp	Surg	Indiv	26		1	10	927
New Milford 3 000—Litchfield New Milford Hospital	Gen	NPAssn	30	8	73	13	378
Newtown 482—Fairfield Fairfield State Hospital	Ment	State	928			897	182
Norwalk 36 010—Fairfield Norwalk General Hospital*o	Gen	NPAssn	108	23	661	181	3 901
Norwich 23 071—New London Norwich State Hospital	Ment	State	3 132			2 960	1 492
Norwich State Tuberculosis Sanat (Uncas On Thames)*	TB	State	395			390	303
William W Backus Hosp**o	Gen	NPAssn	121	20	448		3 336
Putnam 7 518—Windham Day Kimball Hospital	Gen	NPAssn	70	16	206	54	1 590
Rockville 7 445—Tolland Rockville City Hospital	Gen	NPAssn	30	10	103	14	411
Sharon 500—Litchfield Sharon Hospital	Gen	NPAssn	40	12	188	22	724
Shelton 10 113—Fairfield Laurel Heights State Tuberculosis Sanatorium	TB	State	200			343	245
South Norwalk 8 968—Fairfield Dr Wadsworth's Sanitarium	N&M	Indiv	20			16	15
Stafford Springs 3 492—Tolland Cyril and Julia C Johnson Memorial Hospital	Gen	NPAssn	38	12	177	20	648
Stamford 46 346—Fairfield Dr Barnes Sanitarium	N&M	Corp	60			35	102
Stamford Hall	N&M	Corp	160			137	197
Stamford Hospital*o	Gen	NPAssn	227	37	670	141	4 625
Topham Grange	N&M	Corp	28			13	8
Thompsonville 9 643—Hartford Elmercroft Dr Vail's Sanat	N&M	Corp	20				
Torrington 26 040—Litchfield Charlotte Hungerford Hosp	Gen	NPAssn	100	20	388	70	2 003
Wallingford 11 170—New Haven Gaylord Farm Sanatorium* TB	NPAssn		145			140	229
Waterbury 89 902—New Haven St Mary's Hospital*o	Gen	Church	220	44	965	175	8 288
Waterbury Hospital*o	Gen	NPAssn	205	40	792	201	5 400
Waterford 100—New London The Seaside	TbChil	State	175			138	54
West Haven 20 800—New Haven William Wirt Winchester Hospital	TB	NPAssn	60			56	200

## CONNECTICUT—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Westport 6 073—Fairfield Westport Sanitarium	N&M	Corp	100			83	228
Willimantic, 12 162—Windham Windham Community Memorial Hospital	Gen	NPAssn	91	10	232	51	1 732
Winsted 7 883—Litchfield Litchfield County Hospital	Gen	NPAssn	64	11	101	38	1 031
Related Institutions							
Avon 1 000—Hartford Avon Old Farms Infirmary	Inst	Corp	14				127
Bridgeport 145 716—Fairfield Hillside Home and Hosp	Gen N&M	City	205			246	1 740
Cheshire 3 263—New Haven Connecticut Reformatory	Inst	State	28			4	134
Greenwich 5 981—Fairfield Crest View Sanitarium	N&M	Corp	19			15	20
Municipal Hospital	TbIso	City	61	2	1	50	225
Guilford 1 880—New Haven Guilford Sanatorium	Gen	Corp	10	4	No data supplied		
Mansfield Depot 306—Tolland Mansfield State Training School and Hospital	MeDe	State	1 200			1 186	42
Rated capacity 1,200							
Meriden 34 481—New Haven Connecticut School for Boys	Inst	State	30			6	200
New Canaan 2,372—Fairfield Silver Hill	Nerv	Corp	22			16	136
New Haven 162 605—New Haven Jewish Home for the Aged	Inst	NPAssn	92			86	25
Yale Infirmary	Inst	NPAssn	30			9	514
Niantic 1 312—New London Connecticut State Farm for Women	Inst	State	60	10	53		
Noroton Heights 1 600—Fairfield Fitch's Home and Hospital	Inst	State	130			104	1 394
Springdale 4 500—Fairfield Nestledown Home	Conv	Indiv	10			7	18
West Hartford 24 941—Hartford St Agnes Home	Mat	Church	10	10	70	3	70
Wethersfield 7 512—Hartford Connecticut State Prison Hospital	Inst	State	30			16	243
Woodmont 581—New Haven Woodmont Hall	Conv	Corp	15			6	57
Summary for Connecticut							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	60	16,207	13 947	147 503			
	17	2 047	1 818	4 803			
Totals	77	18 254	15 765	152 306			
Refused registration	2	65					

## DELAWARE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Dover 4 800—Kent Kent General Hospital	Gen	NPAssn	48	10	162	31	1 106
Farnhurst 200—New Castle Delaware State Hospital*o	Ment	State	1 140			1 121	283
Rated capacity 800							
Ft Dupont (Delaware City P O )—New Castle Station Hospital	Gen	Army	28			15	422
Lewes 1 923—Sussex Beebe Hospitalo	Gen	NPAssn	64	8	62	32	709
Marshallton 1 500—New Castle Brandywine Sanatorium	TB	State	160			113	108
Edgewood Sanat (col)	TB	State	40			33	28
Milford 3 719—Sussex Milford Emergency Hospo	Gen	NPAssn	43	6	127	34	1 208
Wilmington 100 097—New Castle Delaware Hospital*o	Gen	NPAssn	106	29	546	146	4 781
Gross Private Hospital	Gen	Corp	15	6	60	7	242
Homoeopathic Hospital*o	Gen	NPAssn	168	30	644	131	4 300
St Francis Hospitalo	Gen	Church	104	16	208	43	1 576
Wilmington General Hosp*o	Gen	NPAssn	80	18	285	83	3 109
Related Institutions							
Mar hallton 1 000—New Castle Sunnybrook Cottage	TB	NPAssn	24			22	30
Smyrna 1 008—Kent Delaware State Welfare Home	InstGen	StCa	86	4	8	58	647
Stockley 138—Sussex Delaware Colony	MeDe	State	417			262	57
Rated capacity 400							
Summary for Delaware							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	12	2 062	1 709	18 107			
	3	227	442	734			
Totals	15	2 289	2 231	18,841			
Refused registration	0						

## DISTRICT OF COLUMBIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Washington 497,000							
Carson's Private Hosp (col)	Gen	Indiv	1	4	14	8	230
Central Dispensary and Emergency Hospital**	Gen	NPA'sen	2-0			249	7,953
Cherry Chase Sanatorium	N&M	Indiv	23			18	18
Children's Hospital**	Chil	NPA'sen	185			117	6,073
Columbia Hospital for Women and Lying in Asylum*	GynMat	NPA'sen	127	83	1,977	104	3,666
Eastern Dispensary and Casualty Hospital	Gen	NPA'sen	1-0	25	5	57	2,385
Episcopal Eye, Ear and Throat Hospital*	ENT	Church	100			74	6,462
Freedmen's Hosp (col)**	Gen	Fed	322	54	828	237	5,355
Gallinger Municipal Hospital**	Gen	City	1,119	117	1,956	861	17,653
Garfield Memorial Hosp**	Gen	NPA'sen	232	59	1,966	6	6,691
Georgetown University Hospital**	Gen	NPA'sen	210	51	931	140	6,601
George Washington University Hospital*	Gen	NPA'sen	92	22	600	75	2,649
National Homeopathic Hosp	Gen	NPA'sen	60	20	211	42	1,561
Providence Hospital**	Gen	Church	260	30	762	220	6,622
St Elizabeths Hospital*	Gen	Fed	446	4	3	317	1,600
St Elizabeths Hospital**	Ment	Fed	5,351			5,686	1,693
Sibley Memorial Hosp**	Gen	Church	2-6	85	2,009	203	10,093
Tuberculosis Hospital (Glenn Dale Md P O)	TB	City	700			394	334
U S Naval Hospital*	Gen	Navy	202			171	1,555
Veterans Admin Facility	Gen	Vet	327			317	4,654
Walter Reed General Hosp*	Gen	Army	1,219	28	184	985	7,600
Washington Sanitarium and Hospital**	Gen	Church	170	15	360	136	3,019

## Related Institutions

Washington 49,000							
District of Columbia Reformatory Hospital (Lorton Va P O)	Inst	City	80			24	1,076
District Training School (Laurel Md P O)	MeDe	City	546			759	41
Florence Crittenton Home	Mat	NPA'sen	50	50	53	42	143
Home for the Aged and Infirm	Inst	City	120			120	266
Kendall House Sanitarium	Conv	Indiv	22			10	100
National Training School for Boys Hospital	Inst	Fed	70			17	1,391
U S Soldiers Home Hosp	Inst	Gen Army	466			272	1,625
Washington Home for Incurables	Inst	NPA'sen	160			158	73

## Summary for Dist of Columbia

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	22	11,850	10,681	107,218
Related institutions	5	1,474	1,180	4,673
Totals	27	13,320	11,861	111,891
Refused registration	0			

## FLORIDA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Arcadia 40-2-De Soto							
Arcadia General Hospital	Gen	Corp	21	5	136	6	665
Bartow 5,269-Polk							
Bartow General Hospital	Gen	Indiv	20	5	4	8	430
Polk County Hospital	Gen	County	55	5	35	5	1,289
Bay Pines-Plinnas							
Veterans Admin Facility	Gen	Vet	197			192	1,004
Bradenton 59-6-Manatee							
Bradenton General Hospital	Gen	Indiv	15	7	21	7	270
Century 1-2-Escambia							
Turkeyville Hospital	Gen	Part	30	4	25	13	741
Chattahoochee 4-6-Gadsden							
Florida State Hospital	Ment	State	4,219			4,118	866
		Rated capacity	4,000				
Clearwater 7-607-Pinellas							
Morton F Plant Hospital	Gen	NPA'sen	50	10	85	20	667
Coral Gables 5-697-Dade							
University Hospital	Gen	Corp	35	12	1-5	22	995
Dade City 1-811-Pasco							
Jackson Memorial Hospital	Gen	County	13	2	21	4	189
Daytona Beach 16-8-Volusia							
Halifax District Hospital	Gen	NPA'sen	125		129	2	11,204
Halifax District Hospital (Colored Annex)	Gen	NPA'sen	18	6	4	7	2,137
De Land 5-246-Volusia							
De Land Memorial Hospital	Gen	NPA'sen	24	11	29	5	403
Ft Barrancas 1-0-Fcambia							
Station Hospital	Gen	Army	55	2	6	24	1,019
Ft Lauderdale 5-666-Broward							
Broward General Hospital	Gen	City	41	5			Estab 1905
Ft Myers 2-2-Lee							
Lee Memorial Hospital	Gen	NPA'sen	37	4	75	12	511
Calverville 10-45-Vlachua							
Alachua County Hospital	Gen	County	55	10	155	2	1,661
Truett 125-49-Duval							
Brewster Hospital (col)**	Gen	Church	65	10	10	23	95
Duval County Hospital*	Gen	County	155	20	5-6	167	4,491
Dr Randolph Sanitarium	N&M	Indiv	12			6	46
River Ide Hospital**	Gen	NPA'sen	50	6	84	51	1,110

## FLORIDA-Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
St Luke's Hospital**	Gen	NPA'sen	212	22	682	119	4,501
St Vincent's Hospital**	Gen	Church	200	40	575	115	4,446
Key West 12-831-Monroe							
U S Marine Hospital	Gen	USPHS	65			49	590
Kissimmee 3-163-Osceola							
Osceola Hospital	Gen	Indiv	30	5	38	15	517
Lake City, 4-416-Columbia							
Lake Shore Hospital	Gen	Corp	14	3	22	10	475
Veterans Admin Facility	Gen	Vet	300			212	9,056
Lakeland 18-544-Polk							
Morrell Memorial Hospital	Gen	City	100	16	1-2	41	1,357
Lake Wales 3-401-Polk							
Lake Wales Hospital	Gen	NPA'sen	25	6	21	4	163
Leesburg 4-113-Lake							
Theresa Holland Hospital	Gen	Indiv	22	4	82	13	779
Manatee 3-219-Manatee							
Riverside Hospital	Gen	Indiv	20	4	20	7	951
Marianna 3-372-Jackson							
Baltzell Hospital	Gen	Indiv	12	2	3	3	95
Melbourne 2-677-Brevard							
Brevard Hospital	Gen	City	25	5			
Miami 110-637-Dade							
Dade County Hospital	Gen	County	130	13	248	106	2,465
James M Jackson Memorial Hospital**	Gen	City	460	40	1,067	36	19,997
Miami Retreat	N&M	Indiv	70			31	316
Miami Riverside Hospital	Gen	Indiv	50	10	No data supplied		
Victoria Hospital	Gen	Indiv	50	11	427	22	1,347
Miami Beach, 6-494-Dade							
Alton Road Hospital	Gen	Corp	60	6			New
St Francis Hospital	Gen	Church	115	12	119	57	2,046
Miami Springs, 402-Dade							
Miami Battle Creek Sanit	Gen	NPA'sen	105			23	250
Ocala 7-231-Marion							
Munroe Memorial Hospital	Gen	CyCo	85	10	73	25	952
Orlando 27-330-Orange							
Clear Lake Lodge	N&M	Indiv	26			27	253
Florida Sanitarium and Hospital*	Gen	Church	100	12	92	54	1,441
Florida State Sanatorium	TB	State	400			Estab 1918	
Orange General Hospital	Gen	NPA'sen	123	12	249	65	2,947
Panama City 5-402-Bay							
Lisenby Hospital	Gen	Indiv	25	3	70	5	515
Panama City Hospital	Gen	NPA'sen	10	3	72	4	510
Pensacola 31-59-Escambia							
Escambia County Tubercu	TB	CyCo	64			26	65
losis Sanatorium	Gen	Church	125	17	4-4	70	3,255
Pensacola Hospital	Gen	Navy	142			55	1,629
U S Naval Hospital	Gen	Navy	142				
Quincy 3-788-Gadsden							
Gadsden County Hospital	Gen	NPA'sen	35	2	41	9	491
St Augustine 12-111-St Johns							
East Coast Hospital	Gen	NPA'sen	55	7	107	95	1,233
Flagler Hospital	Gen	NPA'sen	50	6	91	30	810
St Petersburg 40-42-Pinellas							
Mercy Hospital (col)	Gen	City	30	5	12	18	550
Mound Park Hospital	Gen	City	135	1	216	67	4,187
St Anthony's Hospital	Gen	Church	50	10	106	25	955
Sanford 10-100-Seminole							
Fernald Laughton Memorial Hospital	Gen	NPA'sen	20	6	74	10	691
Sarasota 8-398-Sarasota							
Joseph Hulton Hospital	Gen	Indiv	10	5	17	8	701
Sarasota Hospital	Gen	City	65	14	83	16	667
Sebring 2-912-Highlands							
Sebring General Hospital	Gen	Indiv	10	4	20	6	240
Dr Weems Hospital	Gen	Indiv	15	3	54	4	211
Tallahassee 10-700-Leon							
Johnston's Sanitarium	Gen	Indiv	32	6	113	15	691
Tampa 101-161-Hillsborough							
Centro Asturiano Hospital	Gen	Frat	7	8	7	57	950
Dr H M Cook's Hospital	Gen	Indiv	25	8	110	16	1,117
St Joseph's Hospital	Gen	Church	60	12	160	90	875
Tampa Municipal Hosp**	Gen	City	300	20	871	157	7,011
Tampa Negro Hospital	Gen	City	30	3	46	13	550
Umatilla 107-Lake							
Harry Ann Crippled Children's Home	Orth	Frat	60			57	271
Lake County Medical Cen	Gen	NPA'sen	35	6	67	29	512
West Palm Beach 26-610-Palm Beach							
Good Samaritan Hospital	Gen	NPA'sen	65	1	250	21	916
Pine Ridge Hospital (col)	Gen	NPA'sen	25	4	7	2	44

## Related Institutions

Daytona Beach 16-8-Volusia							
Daytona Beach Sanitarium	Gen	Indiv	10	2	9	8	179
Galveston 10-46-Vlachua							
Florida Farm Colony	MeDe	State	727			49	21
		Rated capacity	75				
Univ of Florida Infirmary	Gen	State	45			8	715
Jacksonville 123-49-Duval							
Dr. Miller's Sanitarium	Drug	County	20			Estab 1	
Jargo 1-479-Pinellas							
Pinellas County Home	TB	County	32			21	17
Miami 110-677-Dade							
Christian Hospital (col)	Gen	NPA'sen	2	4	91	15	60
Edgewater Hospital	Gen	Part	40	12			
Orange Park 67-Clay							
Moochaven Hospital	In t	Frat	2			11	87
Palatka 6-10-Putnam							
Clendale Hospital	Gen	Indiv	25	4	0	19	1,000
Mary Lawton Sanatorium (col)	Gen	Indiv	70	6		7	1

Key to symbols and abbreviations is on page 986

## FLORIDA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Pafford 400—Union	Inst	State	50			40	1 100
Florida State Farm Hosp	Inst	State					
St Petersburg 404—Pinellas							
American Legion Hospital for Crippled Children	Orth	NP Assn	40			24	228
Carle Restorium	Conv	Indiv	20			9	90
Flurence Crittenton Home	Mat	NP Assn	16	10	23	11	33
Stuart 1924—Martin							
St Lucie Sanitarium	Gen	County	10	3	11	7	148
Pallahasee 10 00—Leon							
Florida Agricultural and Mechanical College Hospital (col)	Inst	Gen State	43	2	7	20	697
Tampa 101 161—Hillsborough							
Hillboro County Tuberculosis Sanatorium	TB	County	87			70	126
Pine Heath Home for Tubercular Children	TB	NP Assn	24			11	17
Vero Beach 2 068—Indian River							
Indian River Hospital	Gen	Indiv	10	5	20	5	289
Winter Haven 5 521—Polk							
Winter Haven Hospital	Gen	NP Assn	12	5	No data supplied		
Summary for Florida							
Hospital and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	71	9 620	7 077	91 109			
	20	1 126	797	6 372			
Totals	91	10 746	7 874	97 481			
Refused registration	1	57					

## GEORGIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albany 14 01—Dougherty							
Phoebe Putney Memorial Hospital	Gen	NP Assn	50	7	1 0	26	1 460
Alto 214—Habersham							
State Tuberculosis Sanat	TB	State	240			279	502
Americus 5 700—Sumter							
Americus and Sumter County Hospital	Gen	NP Assn	70	5	34	16	701
Athens 15 107—Clarke							
Athens General Hospital	Gen	County	67	10	120	30	1 709
Fairhaven Tuberculosis Sanatorium	TB	NP Assn	36				59
Atlanta 360 091—Fulton							
Albert Steiner Clinic for Cancer and Allied Diseases	Ca	City	70			20	140
Battle Hill Sanatorium	TB	City	200			20	100
Blackman Sanatorium	Gen	Indiv	20			10	711
Crawford W Long Memorial Hospital	Gen	NP Assn	140	10	100	80	4 800
Georgia Baptist Hospital	Gen	Church	164	20	600	100	6 000
Grady Hospital	Gen	City	517	96	4 100	469	20 000
Grady Hospital Emory Unit							
Grady Division (col)							
Henrietta Faison Hospital for Children	Chil	NP Assn	40	2		20	800
Piedmont Hospital	Gen	Corp	120	10	320	103	3 800
John de Leon 100—Fulton							
John de Leon and Throat Infirmary	FN	Indiv	12			6	543
Veterans Admin Facility	Gen	Church	100	17	311	90	2 844
Veterans Admin Facility	Gen	City	200			180	2 000
Atlanta 60 422—Richmond							
University Hospital	Gen	City	200	47	724	241	8 000
Veterans Admin Facility	Gen	City	1 100			1 000	8 000
Whitford Hospital for Women and Children	Gen	NP Assn	46	4	76	10	94
Bainbridge 6 141—DeKalb							
Bainbridge Hospital	Surg	Indiv	72	1	10	16	44
Riverside Hospital	Gen	Part	0	6	44	400	
Brunswick 14 000—Chatham							
Brunswick City Hospital	Gen	City	60	10	111	70	876
Cairo 2 169—Grady							
Cairo Hospital	Gen	Indiv	18	4	58	6	400
Canton 2 897—Cherokee							
Coker Hospital	Gen	Corp	75	4	32	19	601
Cedarvale 1 124—Polk							
Hall Chaudron Hospital	Gen	Indiv	8	2	12	3	200
Columbus 4 111—Muscookee							
Columbus City Hospital	Gen	City	170	20	200	51	3 000
Cuthbert 7 221—Randolph							
Pitterson Hospital	Gen	Indiv	70	3	2	14	606
Dalton 8 160—Wilkes							
Hamilton Memorial Hosp	Gen	NP Assn	70	5	90	13	69
DeKalb 11 000—De Kalb							
Scottish Rite Hospital for Crippled Children	Orth	Frat	64			60	291
Donalsonville 1 150—Seminole							
Chascon Hospital	Gen	NP Assn	20	5	90	10	362
Douglas 4 006—Coffee							
Douglas Hospital	Gen	City	21	2			
Dublin 6 000—Macon							
Dublin 6 000—Macon							
Lexington Sanatorium	Gen	Indiv	20	4	30	24	1 000
Hicks Hospital	Gen	Indiv	20	2	4	10	661
Eastman 1 000—Dodge							
Eastman Sanatorium	Gen	Indiv	24	4	12	10	14
Fulton 4 000—Liberty							
Fulton County Hospital	Gen	City	10	2	90	3	440

## GEORGIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Emory University—De Kalb	Gen	NP Assn	212	25	393	135	5 388
Emory University Hospital	Gen	NP Assn	212	25	393	135	5 388
Ft Benning—Chattahoochee	Gen	Army	239	16	116	213	4 342
Ft McPherson (Atlanta P O)	Gen	Army	150—Fulton				
Station Hospital	Gen	Army	226	4	27	166	2 304
Ft Oglethorpe 1 186—Catoosa							
Station Hospital	Gen	Army	206	6	8	100	2 810
Ft Screven 17—Chatham							
Station Hospital	Gen	Army	60			40	911
Gainesville 8 624—Hall							
Downey Hospital	Gen	Corp	52	6	73	30	1 867
Hall County Memorial Hosp	Gen	County	20	4		Estab	1907
Griffin 10 321—Spaulding							
R I Strickland and Son	Gen	Indiv	40	5	78	22	1 016
Memorial Hospital	Gen	Indiv	40	5	78	22	1 016
Homerville 1 150—Clinch							
Huey Hospital	Gen	Indiv	10	1	8	7	300
Hoschton 427—Jackson							
Allen Clinic and Hospital	Gen	Part	14	2	9	4	177
Jesup 2 303—Wayne							
Drs Colvin Ritch Hospital	Gen	Part	20	3	72	12	604
Ina Grange 20 131—Group							
City County Hospital	Gen	City	61	6		Estab	1937
Macon 64 045—Bibb							
Clinic Hospital	Gen	Corp	26	6	45	13	902
Hopewell Sanatorium	TB	City	27			27	44
Macon Hospital	Gen	City	178	24	537	150	4 621
Middle Georgia Hospital	Gen	Corp	50	11	178	30	1 380
Oglethorpe Private Infirmary	Gen	Corp	30	6	54	21	1 014
St Luke Hospital (col)	Gen	Indiv	12	1	No data supplied		
Marletta 7 638—Cobb							
Marletta Hospital	Gen	Corp	30	8	51	10	503
Metter 1 424—Candler							
Metter Sanitarium	Gen	Indiv	7	1	35	3	342
Milledgeville 5 534—Baldwin							
Allen's Invalid Home	N&M	Indiv	100			114	260
Baldwin Memorial Hospital	Gen	Indiv	50	6	29	24	903
Milledgeville State Hosp	Gen	State	7 100			7 075	1 721
Rated capacity 5 000							
Scott Hospital	Gen	Indiv	20	4	8	20	325
Millen 2 227—Jenkins							
Millen Hospital	Gen	Indiv	27	4	18	13	589
Mulkey Hospital	Gen	Indiv	22	4	19	10	432
Monroe 3 706—Walton							
Walton County Hospital	Gen	NP Assn	17	3	9	3	138
Montezuma 2 234—Macon							
Macon County Clinic	Gen	Part	16	3	24	5	300
Rome 21 843—Floyd							
Harbin Hospital	Gen	Part	50	6	164	31	2 686
McCall Hospital	Gen	Corp	60	10	164	23	1 894
Sandersville 3 011—Washington							
Rawlings Sanitarium	Gen	Corp	50	6	44	30	1 170
Savannah 8 704—Chatham							
Central of Georgia Railway Hospital	Indus	NP Assn	62			57	2 104
Charlitz Hospital (col)	Gen	NP Assn	4	12	200	40	3 044
Georgia Infirmary (col)	Gen	NP Assn	60	7	242	50	2 112
Oglethorpe Sanatorium	Gen	Indiv	50	10			
St Joseph Hospital	Gen	Church	100	12	171	50	1 982
Telfair Hospital	Gen	NP Assn	60	20	470	60	2 200
U S Marine Hospital	Gen	USPHS	150			160	1 722
Warren A Candler Hosp	Gen	Church	72	11	233	50	2 605
Smyrna 1 178—Cobb							
Dr Brawner's Sanitarium	N&M	Indiv	40			34	339
Statesboro 3 996—Bulloch							
Bulloch County Hospital	Gen	County	60	6		New	
Van Buren's Sanitarium (col)	Gen	Indiv	20	4	10	10	150
Swainsboro 2 442—Emmanuel							
Franklin Hospital	Gen	Indiv	20	2	24	7	324
State 1 440—Pickens							
Robinson Hospital	Gen	Indiv	12	2	20	7	388
Thomasston 4 922—Upson							
Blackburn Hospital	Gen	Indiv	12	2	2	2	101
Thomasville 11 700—Thomas							
John D Archbold Memorial Hospital	Gen	NP Assn	100	10	90	40	2 006
Lifton 3 300—Fift							
Coastal Plain Hospital	Gen	Corp	20	2	19	5	203
Trion 1 200—Chattooga							
Riegel Hospital	Gen	Indiv	20	5	82	16	913
Valdosta 13 482—Lowndes							
Frank Bird Hospital	Gen	Indiv	22	3	20	11	561
Little-Griffin Owens Saunders Private Hospital	Gen	Corp	70	6	147	20	1 331
Washington 3 100—Wilkes							
Washington General Hosp	Gen	City	26	2	26	12	59
Waycross 10 510—Ware							
Atlantic Coast Line Hosp	Indus	NP Assn	7				
Ware County Hospital	Gen	County	68	8		43	2 109
Related Institutions							
Atlanta 360 691—Fulton							
Atlanta Hospital	Gen	Indiv	20	4	17	10	200
Dwelle's Infirmary (col)	Gen	Indiv	10	2	9	4	145
Florence Crittenton Home	Mat	NP Assn	20	10	27	19	200
Georgia Sanitarium	Gen	Indiv	10	2	1	3	40
Joseph B Whitehead Memorial Hospital	Inst	State	20				200
U S Penitentiary Hospital	Inst	Fed	187			12	1 007
Venerable Hosp and Clinic	Gen	City	60			42	204
William A Harris Memorial Hospital (col)	Gen	Indiv	26	2	8	12	480

Key to symbols and abbreviations is on page 986

## GEORGIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Barwick 499—Brooks							
Sanchez Private Sanitarium	Gen	Indiv	12	2	15	5	400
Cedartown 8124—Polk							
Cedartown Hospital	Gen	Indiv	10	3	38	4	192
Whitely Hospital	Gen	Indiv	10	2	10	1	350
Columbus 43131—Muscogee							
Muscogee County Tuberculo- sis Sanatorium	TB	County	35			20	84
Cordele 6850—Crisp							
Gillespie Hospital (col.)	Gen	Church	30	12	15	10	205
Decatur 13,276—De Kalb							
Georgia Psychoanalytical Health Farm	N&M	Indiv	15			10	55
Gracewood 500—Richmond							
Georgia Training School for Mental Defectives	McDe	State	334			245	101
		Rated capacity	350				
Milledgeville 5534—Baldwin							
Georgia State Penitentiary Tubercular Hospital	Inst	State	75			60	114
Moultrie 8027—Colquitt							
Daniel Emergency Sanit	Gen	Indiv	11	3	No data supplied		
Edmondson Brannen Hosp	Gen	Part	12	2	No data supplied		
Summersville 933—Chattooga							
Summersville Trilon Hospital	Gen	Corp	22	3	No data supplied		
Warm Springs 400—Meriwether							
Georgia Warm Springs Foun- dation	Orth	NPA'sn	113			91	271
Summary for Georgia							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	88	14 407	12 608	137 403			
	20	1 047	674	5 436			
Totals	108	15 544	13 282	142 839			
Refused registration	3	30					

## IDAHO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
American Falls 1280—Power							
Schlitz Memorial Hospital	Gen	County	21	4	113	15	753
Boise 21,544—Ada							
St Alphonsus Hospital	Gen	Church	140	14	248	69	2 629
St Luke's Hospital	Gen	Church	100	16	476	92	4 319
Veterans Admin Facility	Gen	Vet	265			201	1 34
Bonnors Ferry 1418—Boundary							
Bonnors Ferry Hospital	Gen	Corp	25	8	73	9	222
Burley 3826—Cassia							
Cottage Hospital	Gen	Corp	14	4	44	10	498
Coeur d'Alene 8297—Kootenai							
Coeur d'Alene Hospital	Gen	NPA'sn	40			15	60
Lakeside Hospital	Gen	Indiv	22	4	11	14	460
Cottonwood 519—Idaho							
Our Lady of Consolation Hospital	Gen	Church	14	4	25	8	338
Ft Hall 100—Bingham							
Ft Hall Indian Agency Hospital	Gen	IA	14	4	37	10	212
Gooding 1502—Gooding							
Gooding County Hospital	Gen	CyCo	18	6	90	6	504
Hailey 93—Blaine							
Hailey Clinical Hospital	Gen	Indiv	20	6	34	8	438
Idaho Falls 9429—Bonnerville							
Idaho Falls Latter Day Saint's Hospital	Gen	Church	90	25	490	56	2 534
Spencer Hospital	Gen	Corp	26	6	No data supplied		
Kellogg 4124—Shoshone							
Wardner Hospital	Gen	Part	25	6	86	17	931
Lapwai 416—Nez Perce							
Lapwai Sanatorium	TB	IA	132			116	190
Lewiston 9493—Nez Perce							
St Joseph's Hospital	Gen	Church	109	12	300	75	2 070
White Hospital	Gen	Corp	32	4	76	25	900
Moscow 4476—Latah							
Gritman Private Hospital	Gen	Indiv	37	8	116	19	763
Nampa 8206—Canyon							
Mercy Hospital	Gen	Church	60	15	233	31	972
Nazarene Missionary Sanit- arium and Institute	Gen	Church	48	6	97	26	1 966
Orofino 1078—Clearwater							
Orofino Hospital	Gen	Part	25	4	20	25	674
Pocatello 16471—Bannock							
Pocatello General Hosp	Gen	County	70	17	301	42	2 077
St Anthony Mercy Hospi	Gen	Church	50	12	No data supplied		
Potlatch 500—Latah							
Potlatch Hospital	Gen	Part	20	3	27	9	435
Pre ton 3281—Franklin							
General Memorial Hospi tal	Gen	NPA'sn	15	4	121	10	63
Rexburg 3048—Madison							
Rexburg General Hospi tal	Gen	Indiv	10	4	46	6	437
Rupert 2240—Mindokan							
Rupert General Hospital	Gen	Indiv	15	2	16	7	245
St Marie 1076—Benewah							
St Marie Hospital	Gen	Part	20	3	23	11	279
Sandpoint 3290—Bonner							
Graham Hospital	Gen	Indiv	20	5	100	10	500

## IDAHO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Page Hospital	Gen	Indiv	30	10	121	7	97
Soda Springs 831—Caribou							
Caribou County Hospital	Gen	County	38	2	31	20	60
Twin Falls 8787—Twin Falls							
Twin Falls County General Hospital	Gen	County	61	11	342	70	1 645
Wallace 8634—Shoshone							
Providence Hospital	Gen	Church	50	10	114	31	591
Wallace Hospital	Gen	Part	45	5	21	10	57
Wendell 725—Gooding							
St Valentine's Hospital	Gen	Church	22	9	101	10	497
Related Institutions							
Blackfoot 3199—Bingham							
State Hospital South	Ment	State	508			534	191
		Rated capacity	500				
Boise 21544—Ada							
Salvation Army Women's Home and Hospital	Mat	Church	35	17	117	4	165
Malad City 2535—Oneida							
Community Hospital	Gen	NPA'sn	8	4	No data supplied		
Moscow 4476—Latah							
Inland Empire Hospital	Gen	Indiv	12	3	No data supplied		
University of Idaho Infr- mary	Inst	State	15			12	70
Nampa 8206—Canyon							
State School and Colony	McDe	State	552			597	61
		Rated capacity	405				
Orofino 1078—Clearwater							
State Hospital North	Ment	State	400			384	10
		Rated capacity	300				
Priest River 949—Bonner							
Priest River Hospital	Gen	Indiv	10		4	2	4
Summary for Idaho							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	26	1,746	1,150	35 418			
	8	1 630	1 413	1 646			
Totals	44	3,376	2 623	37,064			
Refused registration	3	67					

## ILLINOIS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Alton 30151—Madison							
Alton Memorial Hospital	Gen	Church	75	10		Estab 1977	
Alton State Hospital	Ment	State	1 482			1 470	463
		Rated capacity	1 670				
St Anthony's Infirmary and Sanitarium	Gen	Church	90			60	1 608
St Joseph's Hospital	Gen	Church	125	22	259	60	4 971
Amboy 1942—Lee							
Amboy Public Hospital	Gen	Corp	12	5	No data supplied		
Anna 3436—Union							
Anna State Hospital	Ment	State	2 204			2 110	774
		Rated capacity	2 100				
Hale Willard Memorial Hosp	Gen	City	20	4	34	8	35
Aurora 46589—Kane							
Copley Hospital	Gen	NPA'sn	89	18	400	57	2 269
Kane County Spring Brook Sanitarium	TB	County	82			78	65
Mercyville Sanitarium	N&M	Church	150			193	250
St Charles Hospital	Gen	Church	115	20	995	19	2 018
St Joseph Mercy Hospital	Gen	Church	130	40	481	64	2 552
Batavia 5045—Kane							
Bellevue Place Sanitarium	N&M	Corp	76			25	50
Fox River Sanitarium	TB	NPA'sn	80			55	109
Bellefonte 2542—St Clair							
St Elizabeth's Hospital	Gen	Church	118	17	373	5	956
Station Hospital	Gen	Army	35			9	31
Belvidere 8123—Boone							
Highland Hospital	Gen	NPA'sn	27	9	81	8	21
St Joseph's Hospital	Gen	Church	27	10	121	16	601
Benton 8219—Franklin							
Moore Hospital	Gen	Indiv	20	1	34	10	517
Berwyn 47027—Cook							
Berwyn Hospital	Gen	NPA'sn	75	18	492	46	2 017
Bloomington 30970—McLean							
Vernonite Hospital	Gen	Church	72	11	297	9	1 071
St Joseph's Hospital	Gen	Church	180	20	572	125	3 775
Blue Island 1634—Cook							
St Francis Hospital	Gen	Church	75	15	257	29	1 079
Bree 1947—Clinton							
St Joseph Hospital	Gen	Church	25	6	47	16	50
Bushnell 2550—McDonough							
Elmhurst Sanatorium	TB	County	40			27	53
Calro 13532—Alexander							
St Mary Infirmary	Gen	Church	100	10	71	22	177
Canton 1178—Fulton							
Graham Hospital	Gen	NPA'sn	51	9	250	41	974
Carbondale 7525—Jackson							
Holden Hospital	Gen	Church	50	6	60	24	177
Carlinville 4145—Macoupin							
Macoupin Hospital	Gen	Indiv	20	6	79	20	673

Key to symbols and abbreviations is on page 986

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Centralia 12 583—Marion St Mary's Hospital	Gen	Church	50	7	123	33	1 126
Champaign 20 348—Champaign Burnham City Hospital	Gen	City	110	16	284	60	3 607
Charleston 8 012—Coles Memorial Sanatorium	Gen	Corp	23	4	37	10	347
Oakwood Hospital	Gen	Indiv	21	3	17	6	190
Chicago 33 648—Cook Albert Merritt Billings Hospital	Gen	Corp	21	3	17	6	190
Medical and Surgical Unit of University of Chicago Clinics							
Alexian Brothers Hosp**	Gen	Church	257			153	3 098
American Hospital*	Gen	NPA'sn	150	20	168	65	2 660
Augustana Hospital**	Gen	Church	275	25	481	179	5 318
Belmont Hospital	Gen	Corp	100	25	367	47	2 139
Bethany Home Hospital	Gen	Church	17	2	32	9	273
Bethany Sanitarium and Hospital	Gen	Church	50	16	190	21	1 096
Bob's Roberts Memorial Hospital for Children	Pediatric	Unit of University of Chicago Clinics					
Burrows Hospital	Gen	Indiv	40	6	52	12	507
Chicago Eye, Ear, and Throat Hospital	ENT	Corp	34			7	1 744
Chicago Lying in Hospital and Dispensary*	Mat	NPA'sn	162	160	2 670	90	3 762
Chicago Memorial Hospital*	Gen	NPA'sn	88	20	393	58	2 786
Chicago State Hospital	Ment	State	4 666			4 618	1 507
Rated capacity 4 000							
Children's Memorial Hosp**	Chil	NPA'sn	252			168	4 227
City of Chicago Municipal Tuberculosis Sanitarium*	TB	City	1 201	1	9	1 188	1 635
Columbus Hospital**	Gen	Church	159	15	253	85	3 471
Cook County Children's Hospital	Unit of Cook County Hospital						
Cook County Hospital**	Gen	County	3 150	150	3 635	2 896	72 494
Cook County Psychopathic Hospital	Unit of Cook County Hospital						
Edgewater Hospital*	Gen	NPA'sn	111	24	512	71	4 202
Englewood Hospital*	Gen	NPA'sn	101	25	503	83	3 407
Evangelical Deaconess Hosp	Gen	Church	65	20	130	23	1 068
Evangelical Hospital*	Gen	Church	175	60	1 348	135	7 358
Franklin Boulevard Hosp*	Gen	Corp	60	24	237	43	2 155
Garfield Park Community Hospital*	Gen	NPA'sn	150	32	542	83	4 450
Grant Hospital*	Gen	NPA'sn	201	40	950	149	6 005
Henrotin Hospital*	Gen	NPA'sn	104	20	254	71	2 888
Holy Cross Hospital*	Gen	Church	135	34	814	97	4 917
Hospital of St Anthony de Padua*	Gen	Church	200	40	943	153	5 768
Illinois Central Hospital*	Gen	NPA'sn	247	28	610	147	5 337
Illinois Eye and Ear Infirmary*	ENT	State	200			235	4 832
Illinois Masonic Hospital*	Gen	Frat	159	25	350	65	2 916
Jackson Park Hospital*	Gen	Corp	225	40	500	64	4 042
John B. Murphy Hospital	Gen	Church	100	29	271	52	1 525
Kenner Hospital	Gen	NPA'sn	40	6	61	19	468
Lake View Hospital*	Gen	Corp	110	30	176	40	1 827
La Rbida Jackson Park Sanitarium	Card Chl	NPA'sn	52			31	99
Lewis Memorial Maternity Hospital	Mat	Church	117	126	2 251	74	2 557
Lutheran Deaconess Home and Hospital*	Gen	Church	176	42	789	102	5 244
Lutheran Memorial Hosp**	Gen	Church	175	40	525	68	3 598
Martha Washington Hosp	Gen	NPA'sn	53	13	166	19	1 306
Meyer Hospital*	Gen	Church	300	24	479	204	6 518
Michael Reese Hospital**	Gen	NPA'sn	595	71	1 652	499	17 830
Mercordia Hospital and Home for Infants*	Mat	Church	17	26	281	8	250
Mother Cabrini Memorial Hospital*	Gen	Church	120	20	318	84	3 550
St. Sual Hospital**	Gen	NPA'sn	176	44	880	122	6 520
Municipal Contagious Disease Hospital*	Iso	City	428			261	4 359
Nancy Adele McElwee Memorial and Gertrude Dunn Hicks Memorial Hospital	Orthopedic	Unit of University of Chicago Clinics					
Norwegian American Hosp**	Gen	NPA'sn	133	35	663	67	2 405
Parkway Sanitarium	N&M	NPA'sn	50				
Passavant Memorial Hospital**	Gen	NPA'sn	177	35	456	130	4 637
Pinel Sanitarium	N&M	NPA'sn	50			24	200
Post Graduate Hospital and Medical School	Gen	NPA'sn	85	4	18	10	593
Presbyterian Hospital**	Gen	Church	400	40	920	321	11 188
Providence Hosp (col)**	Gen	NPA'sn	144	25	493	98	3 451
Riverswood Hospital*	Gen	NPA'sn	144	44	1 007	114	6 015
Research and Educational Hospital**	Gen	State	265	25	683	325	6 079
Roseland Community Hospital*	Gen	Corp	101	23	559	75	3 456
St. Anne's Hospital*	Gen	Church	240	60	1 555	205	7 874
St. Anthony de Padua Hosp	See Hospital of St. Anthony de Padua						
St. Bernard's Hospital*	Gen	Church	200	33	624	117	6 956
St. Elizabeth Hospital*	Gen	Church	300	40	955	241	6 345
St. Joseph Hospital*	Gen	Church	250	40	787	117	5 877
St. Luke's Hospital**	Gen	NPA'sn	563	49	1 048	317	12 068
St. Mary of Nazareth Hospital*	Gen	Church	212	35	1 105	130	6 573
St. Vincent's Infant and Maternity Hospital	Mat	Church	30	12	185	18	200

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Sarah Morris Hospital for Children	Unit of Michael Reese Hospital						
Shriners Hospital for Crippled Children*	Orth	Frat	60			60	205
South Chicago Community Hospital*	Gen	NPA'sn	69	17	319	40	2 447
South Shore Hospital	Gen	Corp	100	20	449	54	2 457
Surgical Institute for Crippled Children	Unit of Research and Educational Hospital						
Swedish Covenant Hosp**	Gen	Church	160	42	942	94	4 383
U S Marine Hospital*	Gen	USPHS	265			184	2 071
University Hospital*	Gen	Corp	100	21	150	52	2 653
University of Chicago Clinics**	Gen	NPA'sn	355			309	6 838
Washington Boulevard Hospital*	Gen	NPA'sn	100	10	96	60	2 077
Wesley Memorial Hosp**	Gen	Church	247	21	277	87	3 181
West Side Hospital*	Gen	Corp	165	21	151	50	1 928
Willard Hospital*	Gen	NPA'sn	115	25	614	71	3 627
Women and Children's Hospital*	Gen	NPA'sn	125	25	538	60	2 568
Woodlawn Hospital*	Gen	NPA'sn	86	26	409	59	3 933
Chicago Heights 22 321—Cook St. James Hospital	Gen	Church	125	20	274	37	1 706
Clinton 5 920—DeWitt Dr. John Warner Hospital	Gen	City	25	4	67	16	617
Compton 277—Lee Compton Hospital	Gen	Indiv	10	2			
Danville 36 765—Vermillion Lake View Hospital*	Gen	NPA'sn	145	25	268	96	2 975
St. Elizabeth Hospital*	Gen	Church	150	16	475	130	3 222
Veterans Admin Facility	Gen	Vet	1 641			1 607	768
Decatur 57 510—Macon Hospital	Gen	NPA'sn	140	25	558	88	3 097
Macon County Tuberculosis Sanitarium*	TB	County	80			67	68
St. Mary's Hospital	Gen	Church	155	26	482	119	4 235
Wabash Employees Hosp	Indus	NPA'sn	75			51	1 319
De Kalb 8 545—De Kalb De Kalb County Tuberculosis Sanitarium	TB	County	42			26	52
De Kalb Public Hospital	Gen	City	30	8	116	17	740
St. Mary's Hospital	Gen	Church	50	9	79	20	787
Des Plaines 8 708—Cook Northwestern Hospital	Gen	Corp	15	5	72	8	367
Dixon 9 908—Lee Dixon Public Hospital*	Gen	NPA'sn	60	11	250	41	1 325
Du Quoin 7 593—Perry Marshall Browning Hospital	Gen	NPA'sn	75	10	75	25	802
Dwight 2 534—Livingston Veterans Admin Facility	Gen	Vet	225			198	1 340
East Moline 10 107—Rock Island East Moline State Hospital	Ment	State	2 056			2 004	802
Rated capacity 1 900							
East St. Louis 74 347—St. Clair Christian Welfare Hospital*	Gen	NPA'sn	56	8	247	48	1 721
St. Mary's Hospital*	Gen	Church	260	35	603	125	4 863
Edwardsville 6 235—Madison Madison County Tuberculosis Sanitarium	TB	County	90			72	89
Effingham 4 975—Effingham St. Anthony's Hospital	Gen	Church	92	8	87	37	1 002
Elgin 35 929—Kane Elgin State Hospital*	Ment	State	4 600			4 529	2 291
Rated capacity 4 500							
Resthaven Sanitarium	NCM	Indiv	75			72	214
St. Joseph Hospital*	Gen	Church	150	18	168	49	1 433
Sherman Hospital*	Gen	NPA'sn	110	20	445	86	3 460
Elmhurst 14 055—Du Page Elmhurst Community Hosp	Gen	NPA'sn	90	20	329	56	2 674
Evansville 63 338—Cook Evanston Community Hospital (col)	Gen	NPA'sn	21	4	38	11	226
Frankston Hospital**	Gen	NPA'sn	228	32	929	192	8 604
St. Francis Hospital*	Gen	Church	303	50	772	113	7 318
Evergreen Park 1 594—Cook Little Company of Mary Hospital*	Gen	Church	155	39	907	110	6 144
Ft. Sheridan 2 000—Lake Station Hospital	Gen	Army	147	6	50	131	3 653
Freeport 22 045—Stephenson Evangelical Deaconess Hospital*	Gen	Church	85	16	253	55	2 113
St. Francis Hospital*	Gen	Church	100	19	247	58	2 337
Galesburg 28 830—Knox Galesburg Cottage Hosp*	Gen	NPA'sn	82	18	285	47	1 722
St. Mary's Hospital	Gen	Church	100	16	207	55	2 010
Ceneo 3 406—Henry J. C. Hammond City Hosp	Gen	City	25	5	67	7	376
Geneva 4 607—Kane Community Hospital*	Gen	NPA'sn	73	12	191	36	1 401
Granite City 25 130—Madison St. Elizabeth Hospital*	Gen	Church	103	22	347	73	2 833
Great Lakes—Lake U S Naval Hospital	Gen	Navy	331			65	1 308
Harrisburg 11 625—Saline Harrisburg Hospital	Gen	Corp	25	1	16	9	276
Lightner Hospital	Gen	Indiv	35	5	46	17	876
Harvard 2 055—McHenry Harvard Community Hosp	Gen	Part	21	5	50	13	399
Harvey 16 374—Cook Ingalls Memorial Hospital	Gen	NPA'sn	95	25	453	32	1 715

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Herrin 9708—Williamson	Gen	Indiv	40	6	64	24	760
Herrin Hospital	Gen	Indiv	40	6	64	24	760
Highland 3319—Madison	Gen	Church	72	8	145	50	1461
St Joseph's Hospital	Gen	Church	72	8	145	50	1461
Highland Park 1220—Lake	Gen	NPA'sn	53	17	192	27	1484
Highland Park Hospital	Gen	NPA'sn	53	17	192	27	1484
Hillsboro 443—Montgomery	Gen	NPA'sn	37	5	47	13	497
Hillsboro Hospital	Gen	NPA'sn	37	5	47	13	497
Hines—Cook	Gen	Indiv	1760			1644	8,01
Veterans Admin Facility	Gen	Indiv	1760			1644	8,01
Hinsdale 6923—Du Page	Gen	NPA'sn	110	15	151	50	1,518
Hinsdale Sanitarium and Hospital	Gen	NPA'sn	110	15	151	50	1,518
Jacksonville 17747—Morgan	Ment	State	2216			3185	879
Johnsonville State Hospital	Ment	State	2216			3185	879
Morgan County Tuberculosis Sanatorium Oaklawn	TB	County	40			21	40
Norbury Sanatorium	N&M	Corp	125			79	181
Our Saviour's Hospital	Gen	Church	78	12	112	40	1,381
Passavant Memorial Hosp	Gen	Church	73	12	122	43	1,197
Jobet 42992—Will	Gen	Church	100	16	78	150	5,124
St Joseph's Hospital	Gen	NPA'sn	100	16	78	150	5,124
Silver Cross Hospital	Gen	NPA'sn	100	16	78	150	5,124
Will County Tuberculosis Sanatorium	TB	County	96			83	69
Kankakee 20620—Kankakee	Ment	State	4017			4011	1340
Kankakee State Hospital	Ment	State	4017			4011	1340
St Mary Hospital	Gen	Church	120	12	27	64	2,094
Kensworth 2401—Cook	N&M	Indiv	30			22	51
Kensworth Sanitarium	N&M	Indiv	30			22	51
Kewanee 17093—Henry	Gen	NPA'sn	54	12	172	36	1,115
Kewanee Public Hospital	Gen	Church	56	11	108	40	836
St Francis Hospital	Gen	Church	56	11	108	40	836
Lake Forest 6534—Lake	Gen	NPA'sn	43	9	83	15	599
Alice Home Hospital	Gen	NPA'sn	43	9	83	15	599
La Salle 13149—La Salle	Gen	Church	85	15	296	56	1,757
St Mary Hospital	Gen	Church	85	15	296	56	1,757
Libertyville, 3791—Lake	Gen	NPA'sn	25	6	63	8	321
Condell Memorial Hospital	Gen	NPA'sn	25	6	63	8	321
Lincoln 1285—Logan	Gen	Church	42	8	118	35	1,419
Evangelical Deaconess Hospital	Gen	Church	42	8	118	35	1,419
St Clara's Hospital	Gen	Church	66	10	97	41	1,064
Litchfield 6612—Montgomery	Gen	Church	146	8	179	106	3,113
St Francis Hospital	Gen	Church	146	8	179	106	3,113
Mackinaw 760—Tazewell	TB	County	45			40	52
Oak Knoll Sanatorium	TB	County	45			40	52
Macomb 8, 62—McDonough	Gen	Corp	47	6	77	24	651
Marietta Phelps Hospital	Gen	Church	63	10	167	43	1,324
St Francis Hospital	Gen	Church	63	10	167	43	1,324
Manteno 1,140—Kankakee	Ment	State	2,000			3,270	806
Manteno State Hospital	Ment	State	2,000			3,270	806
Mattoon 14631—Coles	Gen	Church	43	10	79	28	1,104
Memorial Methodist Hosp	Gen	Church	43	10	79	28	1,104
Melrose Park 10741—Cook	Gen	Corp	75	16	206	31	1,79
Westlake Hospital	Gen	Corp	75	16	206	31	1,79
Mendota 4008—La Salle	Gen	Indiv	15	4	59	4	416
Harris Hospital	Gen	Indiv	15	4	59	4	416
Moline 32236—Rock Island	Gen	Church	135	16	242	45	1,577
Lutheran Hospital	Gen	Church	135	16	242	45	1,577
Moline Public Hospital	Gen	City	135	22	546	76	2,711
Monmouth 8666—Warren	Gen	City	10	12	26	82	
Monmouth Hospital	Gen	City	10	12	26	82	
Morris 5568—Grundy	Gen	NPA'sn	35	10	137	18	511
Morris Hospital	Gen	NPA'sn	35	10	137	18	511
Monequa 1478—Shelby	Gen	Indiv	24	8	41	13	10
Monequa Hospital	Gen	Indiv	24	8	41	13	10
Murphyboro 8152—Jackson	Gen	Church	35	6	64	25	940
St Andrew's Hospital	Gen	Church	35	6	64	25	940
Naperville 5115—Du Page	TB	NPA'sn	51			66	155
Edward Sanatorium	TB	NPA'sn	51			66	155
Normal 676—McLean	Gen	Church	91	15	212	60	966
Brokaw Hospital	Gen	Church	91	15	212	60	966
Fairview Sanatorium	TB	County	50			45	40
North Chicago 8466—Lake	Ment	Fed	1135			1155	18
Veterans Admin Facility	Ment	Fed	1135			1155	18
North Riverside (Riverside P O) 99—Cook	TB	City	70			10	97
Municipal Tuberculosis Home	TB	City	70			10	97
Oak Forest 83—Cook	Gen	County	1016			1015	1,711
Cook County Infirmary	Gen	County	1016			1015	1,711
Cook County Tuberculosis Hospital	TB	County	634				449
Oak Park 6352—Cook	Gen	Church	125	40	632	104	4,479
Oak Park Hospital	Gen	Church	125	40	632	104	4,479
West Suburban Hospital	Gen	NPA'sn	2100	1159		145	64
Olney 6140—Richland	Gen	Corp	70	8	No data supplied		
Olney Sanatorium	Gen	Corp	70	8	No data supplied		
Ottawa 15694—La Salle	TB	County	0				
Highland	TB	County	0				
Ottawa Tuberculosis Sanat	TB	County	117			1	167
Ryburn Memorial Hospital	Gen	City	6	12	311	42	1,67
Pana 565—Christian	Gen	Church	0	12	57	15	769
Huber Memorial Hospital	Gen	Church	0	12	57	15	769
Paris 565—Fidlar	Gen	Corp	40	6	25	22	1,127
Paris Hospital	Gen	Corp	40	6	25	22	1,127
Pekin 16120—Tazewell	Gen	NPA'sn	15	25		40	1,320
Pekin Public Hospital	Gen	NPA'sn	15	25		40	1,320
Peoria 16140—Peoria	Gen	NPA'sn	100	15	No data supplied		
John C. Proctor Hospital	Gen	NPA'sn	100	15	No data supplied		

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Methodist Hospital of Central Illinois	Gen	Church	195	36	819	156	5,915
Michell Farm	N&M	Indiv	26			14	46
Peoria Municipal Tuberculosis Sanatorium	TB	City	93			89	1,700
Peoria Sanatorium	N&M	Indiv	25			18	105
Peoria State Hospital	Ment	State	2,400		2,500		
Rated capacity			2,500				
St Francis Hospital	Gen	Church	350	47	1,277	252	9,955
Peru, 9121—La Salle	Gen	NPA'sn	40	10	120	50	1,000
Peoples Hospital	Gen	NPA'sn	40	10	120	50	1,000
Pontiac 8272—Livingston	TB	County	35			31	47
Livingston County Sanat	TB	County	35			31	47
St James Hospital	Gen	Church	40	12	177	20	75
Princeton 4762—Bureau	Gen	Church	40	12	177	20	75
Julia Rackly Perry Memorial Hospital	Gen	City	41	9	165	96	1,109
Quincy 39241—Adams	Gen	NPA'sn	125	20	364	78	2,570
Blessing Hospital	Gen	NPA'sn	125	20	364	78	2,570
Hillcrest	TB	County	50			47	45
St Mary Hospital	Gen	Church	195	20	481	150	4,101
Rantoul 155—Champaign	Gen	Church	195	20	481	150	4,101
Station Hospital	Gen	Army	50	1	1	23	41
Red Bud 1208—Randolph	Gen	Church	22	2	29	10	98
St Clement's Hospital	Gen	Church	22	2	29	10	98
Robinson 3668—Crawford	Gen	Part	18	3	15	3	119
Robinson Hospital	Gen	Part	18	3	15	3	119
Rockford 85864—Winnebago	N&M	Indiv	35			22	157
Elmhurst (Winnebago Sanit)	N&M	Indiv	35			22	157
Rockford Hospital	Gen	NPA'sn	82	18	248	65	2,500
Rockford Municipal Tuberculosis Sanatorium	TB	City	196			111	1,600
St Anthony's Hospital	Gen	Church	180	40	734	120	4,711
Swedish American Hospital	Gen	NPA'sn	72	10	317	59	1,575
Winnebago County Hosp	Gen	County	72	0	41	47	1,068
Rock Island 37953—Rock Island	TB	County	75			66	1,400
Rock Island County Tuberculosis Sanatorium	TB	County	75			66	1,400
St Anthony's Hospital	Gen	Church	160	18	205	72	2,460
Rosclaire 1794—Hardin	Gen	Indiv	13	2	90	4	276
Rosclaire Hospital	Gen	Indiv	13	2	90	4	276
Rushville 2398—Schuyler	Gen	Indiv	27	3	15	5	270
Culbertson Hospital	Gen	Indiv	27	3	15	5	270
St Charles 5377—Kane	Gen	NPA'sn	20	6	48	7	225
St Charles City Hospital	Gen	NPA'sn	20	6	48	7	225
Savanna 5086—Carroll	Gen	City	15	5	42	5	155
Savanna City Hospital	Gen	City	15	5	42	5	155
Shelbyville 3491—Shelby	Gen	NPA'sn	15	5	49	11	405
Shelby County Memorial Hospital	Gen	NPA'sn	15	5	49	11	405
Springfield 71864—Sangamon	TB	Corp	75			55	95
Palmer Sanatorium	TB	Corp	75			55	95
St John's Crippled Children's Home	Unit of St John's Sanitarium		560	40	983	404	10,070
St John's Hospital	Gen	Church	560	40	983	404	10,070
St John's Sanitarium	TB	Or	300			200	40
Springfield Hospital	Gen	NPA'sn	100	15	394	84	99
Spring Valley 5270—Bureau	Gen	Church	68	7	185	52	1,610
St Margaret's Hospital	Gen	Church	68	7	185	52	1,610
Sterling 10812—Whiteside	Gen	NPA'sn	25	6	57	10	571
Homo Hospital	Gen	NPA'sn	25	6	57	10	571
Public Hospital	Gen	City	51	12	27	23	1,945
Streator 14728—La Salle	Gen	Church	125	10	317	65	3,605
St Mary's Hospital	Gen	Church	125	10	317	65	3,605
Sublett 261—Lee	Angear Maternity Hospital	Indiv	10	10	51	3	51
Angear Maternity Hospital	Indiv	10	10	51	3	51	
Sycamore 4621—De Kalb	Gen	City	25	7	73	11	465
Sycamore Municipal Hosp	Gen	City	25	7	73	11	465
Taylorville, 7910—Christian	Gen	Church	62	12	165	49	1,666
St Vincent Hospital	Gen	Church	62	12	165	49	1,666
Tucola 2569—Douglas	Gen	County	33	5	95	21	827
Douglas County Jarman Hospital	Gen	County	33	5	95	21	827
Urbana 13000—Champaign	Gen	Corp	40	10	80	28	1,450
Carle Memorial Hospital	Gen	Corp	40	10	80	28	1,450
Champaign County Hosp	Gen	County	55	8	101	35	917
Mercy Hospital	Gen	Church	60	12	197	54	1,969
The Outlook	TB	County	36			34	20
Vandell 442—Fayette	Gen	Indiv	30	8	45	19	68
Mark Greer Hospital	Gen	Indiv	30	8	45	19	68
Waterman 520—De Kalb	Gen	Indiv	25	7	56	14	55
East Side Hospital	Gen	Indiv	25	7	56	14	55
Watseka 3144—Iroquois	Gen	NPA'sn	41	11	150	25	1,120
Iroquois Hospital	Gen	NPA'sn	41	11	150	25	1,120
Waukegan 2244—Lake	Gen	County	85	12	151	76	1,410
Lake County General Hospital	Gen	County	85	12	151	76	1,410
St Theresa's Hospital	Gen	Church	150	21	472	74	2,655
Victory Memorial Hospital	Gen	NPA'sn	76	14	301	24	1,100
Winfield 445—Du Page	TB	NPA'sn	78			71	1,070
Winfield Sanatorium	TB	NPA'sn	78			71	1,070
Zaca Sanatorium	TB	NPA'sn	50			50	610
Woodstock 5441—McHenry	Gen	NPA'sn	21	7	59	17	1,000
Woodstock Public Hospital	Gen	NPA'sn	21	7	59	17	1,000
Zeller 2516—Franklin	Gen	NPA'sn	17	2			
Zeller Hospital	Gen	NPA'sn	17	2			
Related Institutions							
Arrowsmith 29—McLean	Gen	Indiv	10	2	17	1	1
L M Johnson Hospital	Gen	Indiv	10	2	17	1	1
Avon 9—Fulton	Gen	NPA'sn	12	4	33	6	17
Saunders Hospital	Gen	NPA'sn	12	4	33	6	17
Chicago 774—Cook	Conv	Indiv	10			6	1
Leverly Hills Rest Home	Conv	Indiv	10			6	1

## Related Institutions

Arrowsmith 29—McLean	Gen	Indiv	10	2	17	1	
L M John on Hospital	Gen	Indiv	10	2	17	1	
Avon 9—Fulton	Gen	NPA'sn	12	4	23	6	16
Saunders Ho pital	Gen	NPA'sn	12	4	23	6	16
Chicago 27-4—Cook	Conv	Indiv	10			6	16
Levery Hills Ret Home	Conv	Indiv	10			6	16



## ILLINOIS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Chicago Home for Convalescent Women and Children	Conv	NP Assn	41			37	228
Chicago Home for Incurables	Inc	NP Assn	290			280	60
Dora Levine Gordon Rest Home	Conv	Indiv	15			10	
House of Correction Hosp	Inst	City	70			37	1,557
Isolation Hospital	SmPos	City	1			1	31
Longs Convalescent Home	Conv	Indiv	14			9	58
North Side Rest Home	N&M	Part	10			7	13
Parkway Lodge Convalescent Home for Men and Women	Conv	NP Assn	276			171	757
Salvation Army Women's Home and Hospital	Mat	Church	20	10	194	71	244
Washington and Jane Smith Home	Inst	Gen NP Assn	21			10	110
Decatur 57510—Macon City Public Hospital	Is	City	26			10	207
Dixon 908—Ice	McDe	State	662			375	519
Dixon State Hospital		Rated capacity	4372				
Eldorado 4487—Saline Ferrell Hospital	Gen	Indiv	12	2	9	3	144
Evanston 6338—Cook Grove House for Convalescents	Conv	NP Assn	26			10	133
The Cradle	Chil	NP Assn	30			23	203
Fairbury 2310—Livingston Fairbury Hospital	Gen	NP Assn	10	0	70	5	320
Geneva 4607—Kane State Training School for Girls	Inst	State	20	15	2	17	98
Godfrey 201—Madison Beverly Hospital	McDe	Corp	72			64	10
Henry 168—Marshall Dr. Coggeshall and Dyarst Hospital	Gen	Part	7	4	15	2	102
Hinsdale 6923—DuPage West Suburban Home for Girls	Mat	NP Assn	20	16	29	7	42
Lincoln 12800—Logan Lincoln State School and Colony	McDe	State	804	10	5	3507	400
		Rated capacity	4379				
Mattoon 14631—Coles Independent Order Odd Fellows Old Folks Home Hospital	Inst	Frat	71			38	100
Menard 27—Randolph Illinois Security Hospital	Vent	State	418			400	110
		Rated capacity	500				
Prison Hospital of Illinois State Penitentiary	Inst	State	3			28	603
Metropolis 557—Massac Fisher Hospital	Gen	Indiv	10	2	29	4	307
Minonk 1910—Woodford Woodford County Tuberculosis Sanatorium	IB	County	12			8	0
Moosheart 1510—Kane Moosheart Memorial Hosp	Inst	ChilFrat	60			42	1795
Mt Prospect 1220—Cook Mt Prospect General Hosp	Gen	Indiv	10	4	20	3	200
Normal 6768—McLean Soldiers and Sailors Children's School	Inst	State	20			17	892
Patton 892—Ford Patton Community Hosp	Gen	NP Assn	17	4	71	6	462
Pontiac 822—Livingston Illinois State Penitentiary Hospital	Inst	State	40			17	8.6
Princeville 994—Peoria Seven Oaks Rest Home and Hospital	Gen	Indiv	14	4	24	7	48
Quincy 39241—Adams Quincy Memorial Sanitarium	Conv	NP Assn	10			9	110
St Charles 537—Kane St Charles School for Boys	Inst	State	30			70	
Urbana 13060—Champaign McKinley University Hosp	Inst	State	100			27	
Wedron 909—La Salle St Joseph's Health Reort	Conv	Church	75			46	888
West Chicago 3447—DuPage Country Home for Convalescent Crippled Children	Orth	NP Assn	120			78	92
Wheaton 708—DuPage Mary E Logue School	McDe	Indiv	40			37	14
Wheeling 467—Cook Wheeling Hospital	Gen	Indiv	9	4	8	1	18
White Hall 2098—Greene White Hall Hospital	Gen	Indiv	10	5	50	6	200
Winnetka 10166—Cook North Shore Health Resort	Conv	Corp	70			50	252
Summary for Illinois							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	260	60,017	54,409	670,465			
	44	9,416	9,189	1,014			
Totals	304	74,400	63,598	681,479			
Refused registration	46	1,661					

## INDIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Anderson 39804—Madison St John's Hickey Memorial Hospital	Gen	Church	100	15	436	97	2,656
Angola 266—Steuben Cameron Hospitals	Gen	Indiv	20	3	21	11	504
Argos 1211—Marshall Kelly Hospital	Gen	NP Assn	10	4	5	4	164
Auburn 5088—De Kalb Dr Bonnell M Souder Hosp	Gen	Indiv	20	12	29	7	212
Batesville 2838—Ripley Margaret Mary Hospital	Gen	Church	50	10	133	21	646
Bedford 13208—Lawrence Dunn Hospital	Gen	Corp	27	6			
Beech Grove 352—Marion St Francis Hospital	Gen	Church	140	30	603	64	2,098
Bloomington 18227—Monroe Bloomington Hospital	Gen	NP Assn	36	6	75	28	1,172
Bluffton 074—Wells Wells County Hospital	Gen	County	24	3	99	19	602
Brazil 8744—Clay Clay County Hospital	Gen	County	40	10	78	20	677
Clinton 7936—Vermillion Vermillion County Hospital	Gen	County	37	6	92	23	849
Columbus 9930—Bartholomew Bartholomew County Hosp	Gen	County	40	6	128	23	863
Connersville 12790—Fayette Fayette Memorial Hospital	Gen	NP Assn	40	8	175	26	862
Crawfordsville 10303—Montgomery Culver Hospital	Gen	County	50	12	220	42	1,700
Crown Point 4046—Lake Lake County Tuberculosis Sanatorium	IB	County	210			200	170
Decatur 5106—Adams Adams County Memorial Hospital	Gen	County	29	6	100	19	783
Last Chicago 34784—Lake St Catherine's Hospital	Gen	Church	190	60	742	192	5,700
Elkhart 2949—Elkhart Elkhart General Hospital	Gen	NP Assn	75	10	360	34	1,914
Elwood 10630—Madison Mercy Hospital	Gen	Church	40	15	263	19	930
Evansville 102249—Vanderburgh Boehne Tuberculosis Hosp	IB	County	125			118	540
Evansville State Hospital	Ment	State	1,139			1,168	364
		Rated capacity	1,900				
Protestant Deaconess Hosp	Gen	Church	165	20	501	112	4,645
St Mary's Hospital	Gen	Church	130	15	191	89	3,762
U S Marine Hospital	Gen	USPHS	100			59	691
Welborn Walker Hospital	Gen	Corp	111	6	103	72	2,815
Ft Benjamin Harrison—Marion Station Hospital	Gen	Army	104	4	27	125	2,221
Ft Wayne 114940—Allen Irene Byron Sanatorium	IB	County	27			190	471
Lutheran Hospital	Gen	Church	140	25	527	117	3,364
Methodist Episcopal Hosp	Gen	Church	87	22	216	10	2,702
St Joseph Hospital	Gen	Church	240	40	757	162	5,628
Frankfort 12196—Clinton Clinton County Hospital	Gen	County	43	7	109	25	904
Garrett 4428—De Kalb Sacred Heart Hospital	Gen	Church	42	6	43	19	505
Gary 100496—Lake Methodist Episcopal Hosp	Gen	Church	85	20	509	97	3,302
St Antonio Hospital	Gen	Corp	50	10	20	20	410
St John Hospital (col)	Gen	Indiv	10	6	14	3	206
St Mary's Mercy Hosp	Gen	Church	270	40	1,057	187	7,038
Greencastle 46135—Putnam Putnam County Hospital	Gen	County	30	5	66	17	862
Greensburg 5702—Decatur Decatur County Memorial Hospital	Gen	County	25	5	77	14	642
Hammond 64060—Lake Mount Mercy Sanitarium	N&M	Church	20			26	131
St Margaret's Hospital	Gen	Church	214	36	1,002	137	5,120
Hartford City 6613—Blackford Blackford County Hospital	Gen	County	30	5	102	12	429
Huntington 13420—Huntington Huntington County Hosp	Gen	County	26	6	120	21	805
Indianapolis 364161—Marion Central State Hospital	Ment	State	1,815			1,869	362
		Rated capacity	1,770				
Community Hospital (col)	Gen	NP Assn	20	5	28	8	227
Dr W B Fletcher's Sanatorium (Neuronhurst)	N&M	Corp	50			21	130
Flower Mission Memorial Hospital	Gen	Unit of Indianapolis City Hospital					
Indianapolis City Hosp	Gen	City	604	39	676	437	10,647
Indiana University Hospitals	Gen	State	466	38	890	382	9,421
James Whitecomb Riley Hospital for Children	Gen	Pediatric Unit of Indiana Univ Hospitals					
Kiwanis Home	Gen	Unit of Indiana University Hospitals					
Methodist Episcopal Hospital	Gen	Church	505	59	1,419	478	27,200
Norway's Sterne Memorial Hospital	N&M	Corp	70			11	140
Robert W Long Hospital	Gen	Medical and Surgical Unit of Indiana University Hospitals					
Rotary Convalescent Home	Gen	Unit of Indiana University Hospitals					
St Vincent's Hospital	Gen	Church	260	38	881	167	7,100
Veterans Admin Facility	Gen	Yel	172			157	1,764
William H Coleman Hospital for Women	Gen	Maternity Unit of the Indiana University Hospitals					
Jeffersonville 11946—Clark Clark County Memorial Hospital	Gen	County	25	6	94	29	532

## INDIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Kendallville 5439—Noble Lakeside Hospital	Gen	City	22	12	68	12	593
Kokomo, 32842—Howard Good Samaritan Hospital	Gen	Church	50			27	448
St. Joseph Memorial Hosp	Gen	Church	50	12	171	30	1,091
LaFayette 26240—Tippecanoe LaFayette Home Hospital	Gen	NP Assn	130	25	268	55	2,066
St. Elizabeth Hospital	Gen	Church	225	20	594	138	4,811
William Ross Sanatorium	TB	County	40			40	51
La Porte 15755—La Porte Fairview Hospital	Gen	NP Assn	34	8	67	18	693
Holy Family Hospital	Gen	Church	90	15	265	66	2,122
Lebanon 6445—Boone Witham Memorial Hospital	Gen	County	25	6	92	20	587
Logansport 18505—Cass Cas County Hospital	Gen	County	40	8	182	30	1,301
Logansport State Hospital	Gen	State	1688			1,688	290
St. Joseph's Hospital	Gen	Church	340			340	1,030
Madison 6530—Jefferson Kings Daughters Hospital	Gen	NP Assn	50	10	54	20	723
Marion 24496—Grant Marion General Hospital	Gen	NP Assn	55	7	181	32	1,140
Martinsville 4962—Morgan Morgan County Memorial Hospital	Gen	County	18	5	55	7	515
Michigan City 26735—La Porte Clinic Hospital	Gen	Corp	50	10	35	22	629
St. Anthony's Hospital	Gen	Church	100	10	194	31	1,172
Mishawaka 28630—St. Joseph St. Joseph Hospital	Gen	Church	102	18	476	60	2,330
Muncie 46548—Delaware Ball Memorial Hospital	Gen	NP Assn	213	20	621	146	4,618
New Albany 25819—Floyd St. Edward's Hospital	Gen	Church	100	14	182	49	1,641
Newcastle 14027—Henry Henry County Hospital	Gen	County	60	9	191	40	1,514
Clinic Hospital	Gen	Part	15	5	100	9	580
North Madison, 573—Jefferson Madison State Hospital	Gen	State	1,671			1,640	338
Rated capacity 1,580							
Onklandon 350—Marion Sunnyside Sanatorium	TB	County	250			254	278
Peru 12730—Miami Dukes Miami County Memorial Hospital	Gen	County	48	12	130	30	987
Wabash Railroad Employees Hospital	Indus	NP Assn	50			31	624
Plymouth 3290—Marshall Parkview Hospital	Gen	NP Assn	30	8	108	22	917
Portland 5276—Jay Jay County Womens Hosp	Gen	Corp	14	5	69	11	603
Princeton 750—Gibson Methodist Episcopal Hosp	Gen	Church	20	6	103	16	549
Reneker 2785—Jasper Jasper County Hospital	Gen	County	38	10	176	23	934
Richmond 32493—Wayne Reid Memorial Hospital	Gen	NP Assn	126	22	366	74	2,845
Richmond State Hospital	Gen	State	1,375			1,359	287
Rated capacity 1,471							
Smith Esteb Memorial Hosp	TB	County	50			28	50
Rochester 3518—Fulton Woodlawn Hospital	Gen	Indiv	31	5	42	23	777
Rockville 1832—Parke Indiana State Sanatorium	TB	State	300			206	160
Rushville 5709—Rush City Hospital	Gen	City	8	3	41	3	156
Seymour 7503—Jackson Schneek Memorial Hospital	Gen	NP Assn	23	5	100	18	710
Shulbyville 10618—Shelby W. S. Major Hospital	Gen	City	42	10	93	19	80
South Bend 104193—St. Joseph Fpworth Hospital	Gen	NP Assn	155	37	725	110	4,791
Healthwin Hospital	TB	County	215			105	287
Pennington Sanitarium	NAM	Indiv	18				
St. Joseph Hospital	Gen	Church	125	22	510	72	2,710
Sullivan 5706—Sullivan Mary Sherman Memorial Hospital	Gen	County	50	7	86	27	763
Tell City 4873—Perry Parkview Hospital	Gen	Indiv	12	2	11	4	122
Terre Haute 62516—Vico St. Anthony's Hospital	Gen	Church	176	27	297	94	2,997
Union Hospital	Gen	NP Assn	154	20	364	102	3,581
Union City 3084—Randolph Union City Hospital	Gen	Indiv	15	3	28	8	351
Valparaiso 8009—Porter Christian Hospital	Gen	NP Assn	20	5	95	12	524
Veterans Administration Hospital—Grant Veterans Admin Facility	Gen	Vet	1,500			1,000	479
Vincennes 1764—Knox Good Samaritan Hospital	Gen	County	92	9	127	72	1,778
Hillcrest Tuberculosis Hosp	TB	County	37				1,007
Wabash 8540—Wabash Wabash County Hospital	Gen	County	38	6	101	25	809
Warsaw 5730—Kosciusko McDonald Hospital	Gen	Indiv	25	8	10	18	721
Murphy Hospital	Gen	Indiv	12	6	20	6	245
Washington 9070—Davies Davess County Hospital	Gen	County	65	15	134	33	1,742
Williamsport 103—Warren Williamsport Hospital	Gen	Indiv	14	4	9	5	182
Winchester 4457—Randolph Randolph County Hospital	Gen	County	30	4	106	18	685
Wolf Lake 20—Noble Luckey Hospital	Gen	Part	20	6	15	9	215

## INDIANA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Anderson 39804—Madison Ella B. Kehr Hospital	TB	County	65			11	115
Hoppes Lying In Hospital	Mat	Indiv	11			3	155
Butler 266—Jennings Muscatatuck Colony	MeDe	State	604				600
Rated capacity 624							0
Dillsboro, 502—Dearborn Dillsboro Sanitarium	Conv	Corp	110			60	
Evansville 102349—Vanderburgh French Hospital	Proct	NP Assn	6			4	250
Ft. Wayne 114040—Allen Ft. Wayne State School	MeDe	State	1,900			1,900	50
Rated capacity 1,400							
Grace Convalescent Hosp	Conv	Indiv	17			10	3
Medical Center Hospital	Gen	Part	12	7	119	8	466
Greencastle 4613—Putnam Indiana State Farm Hosp	Inst	State	20			10	165
Greensburg 5702—Decatur Odd Fellows Home Hospital	Inst	Frat	85			60	54
Indianapolis 364161—Marion Indianapolis Orphan Asylum	Inst	NP Assn	12			4	250
Indiana State School for the Deaf	Inst	State	24			No data supplied	
Julietta Insane Hospital	Inst	County	400			No data supplied	
Suemma Coleman Home	Mat	NP Assn	22	18		46	50
Knightstown 2209—Henry Indiana Sailors and Soldiers Children's Home	Inst	State	37			13	90
Kramer 1200—Warren Mudlavia Springs Hotel and Sanitarium	Conv	Corp	35				50
LaFayette 26240—Tippecanoe Indiana State Soldiers Home Hospital	Inst	State	140			55	251
Lagrange 1640—Lagrange Frwin Hospital	Gen	Indiv	8	2	16	3	16
Michigan City 26736—La Porte Indiana Hospital for Insane Criminals	Ment	State	274			200	19
Rated capacity 200							
Indiana State Prison Hosp	Inst	State	80			50	116
Michigan City Sanitarium	Conv	Corp	26			Estab 1917	
Mooresville 1910—Morgan Comer Sanitarium	Proct	Indiv	15				50
Newcastle 14027—Henry Indiana Village for Epileptics	Epil	State	9			910	110
Rated capacity 91							
Pendleton 1548—Madison Indiana State Reformatory	Inst	State	120			54	560
Plainfield, 1617—Hendricks Indiana Boys School Hosp	Inst	State	31			4	47
Wilkinson 316—Hancock Dr. Charles Titus Hospital	ENT	Indiv	7			2	411

## Summary for Indiana

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	111	18,747	15,626	187,529
Related institutions	25	4,065	4,483	12,900
Totals	136	22,812	20,109	200,429
Refused registration	19	820		

## IOWA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Akron 1304—Plymouth Akron Hospital	Gen	Indiv	14	3	27	4	197
Albia 4425—Monroe Miner's Hospital	Gen	Indiv	25	4	18	8	551
Algona 3955—Kossuth Kossuth Hospital	Gen	Indiv	26	5	96	12	50
Alta 1297—Buena Vista Alta Community Hospital	Gen	NP Assn	15	5	20	6	181
Anamosa 3500—Jones Mercy Hospital	Gen	Church	35	12	66	15	0
Atlantic 5555—Cass Atlantic Hospital	Gen	Corp	35	6	84	19	671
Battle Creek 684—Ida Boone County Ho pital	Gen	Indiv	20	6	20	11	41
Boone 11555—Boone Boone County Ho pital	Gen	County	35	10	26	17	50
Burlington 26755—Des Moines Burlington Protestant Ho pital	Gen	NP Assn	105	20	100	51	201
Merer Hospital	Gen	Church	12	21	162	4	100
St. Francis Hospital	Gen	Church	50	15		20	600
Carroll 4591—Carroll St. Anthony Hospital	Gen	Church	10	22	400	50	114
Cedar Falls 5773—Black Hawk Sartori Memorial Hosp	Gen	City	7	6	107	11	100
Cedar Rapids 5777—Jenn Merer Hospital	Gen	Church	15	27	10	5	0
St. Luke's Methodist Ho pital	Gen	Church	15	20	442	5	0
Centerville 814—Appanoos St. Joseph's Mercy Ho p	Gen	Church	41	6	10	2	100

Key to symbols and abbreviations is on page 986

## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Chariton 5365—Lucas Locom Hospital	Gen	Indiv	16	5	30	10	367
Charles City 8039—Floyd Cedar Valley Hospital	Gen	City	50	5	172	22	1199
Cherokee 6443—Cherokee Cherokee State Hospital	Ment	State	1687 Rated capacity 1,120			1660	473
Slough Valley Hospital Clarinda 4967—Page	Gen	NPA'ssn	30	6	139	30	1108
Clarinda State Hospital	Ment	State	1679 Rated capacity 1200			1613	541
Clinton 20726—Clinton Jane Lamb Memorial Hosp	Gen	NPA'ssn	100	12	260	50	1886
St Joseph Mercy Hosp	Gen	Church	80	12	202	33	1156
Colfax 2213—Tasper Colfax Sanitarium	Gen	Corp	26		No data supplied		
Council Bluffs 42048—Pottawattamie Jennal Edmundson Memo	Gen	NPA'ssn	117	14	230	66	2112
Wiley Hospital	Gen	Church	166	14	206	93	2051
St Bernard's Hospital	N&M	Church	240			161	207
Cresco 3069—Howard St Joseph Mercy Hospital	Gen	Church	20	7	68	8	330
Creston 8615—Union Greater Community Hosp	Gen	NPA'ssn	50	5	No data supplied		
Davenport 60751—Scott Wiley Hospital	Gen	Church	120	20	540	70	2088
Pine Knoll Sanitarium St Elizabeth's and St	TB	County	110			78	137
John's Hospitals St Luke's Hospital	Units of Mercy Hospital	Gen	81	10	473	44	2121
Decorah 4581—Winnebago Lutheran Hospital	Gen	Church	30	6	106	7	537
Denison 3906—Crawford Denison Hospital	Gen	Indiv	15	3	16	3	280
Des Moines 142550—Polk Broadlawn Polk County Public Hospital	Gen	County	130	17	346	110	4033
Broadlawn Polk County Public Hospital	Isa	County	30			22	443
Broadlawn Polk County Public Hospital	TB	County	100			56	87
Iowa Lutheran Hosp	Gen	Church	120	20	410	82	3960
Iowa Methodist Hosp	Gen	Church	231	40	809	150	7540
Mercy Hospital	Gen	Church	163	23	463	100	4163
The Retreat Veterans Admin Facility	N&M	Corp	50			43	133
Dubuque 41769—Dubuque Finley Hospital	Gen	Vet	300			204	2302
St Joseph Mercy Hosp	Gen	NPA'ssn	91	10	188	39	1680
St Joseph Sanitarium	Gen	Church	120	20	375	82	2447
Sunny Crest Sanatorium	N&M	Church	200			183	502
Emmetsburg 2800—Palo Alto Palo Alto Hospital	TB	County	70			67	80
Estherville 4940—Emmet Coleman Hospital	Gen	NPA'ssn	14	6	36	8	347
Fairfield 6619—Jefferson Jefferson County Hospital	Gen	County	30	7	140	17	866
Forest City 2016—Winnebago Irish Hospital	Gen	County	24	6	112	13	599
Ft Des Moines 2000—Polk Station Hospital	Gen	Indiv	12	5	80	9	312
Ft Dodge 2180—Webster Lutheran Hospital	Gen	Army	60	4	37	70	1649
St Joseph Mercy Hosp	Gen	Church	70	17	268	44	2113
Ft Madison 13770—Lee A T & S F Railway Em	Gen	Church	120	12	220	50	1949
Employees Hospital Sacred Heart Hospital	Indus	NPA'ssn	40			18	419
Grinnell 4949—Powshelek Grinnell Community Hosp	Gen	Church	60	10	134	30	1963
St Francis Hospital	Gen	NPA'ssn	51	6	80	10	766
Hamburg 2107—Fremont Hamburg Hospital	Gen	Church	40	10	67	29	960
Hampton 3473—Franklin Lutheran Hospital	Gen	Indiv	16	4	40	11	504
Hartley 1012—O'Brien Hand Hospital	Gen	Church	46	8	100	20	1004
Hull 80—Slough Hull Hospital	Gen	Indiv	12	4	37	4	199
Ida Grove 2206—Ida Ida Grove General Hosp	Gen	Corp	10	3	14	9	390
Ida Grove General Hosp	Gen	Part	12	4	21	4	152
Independence 3091—Buchanan Independence State Hosp	Ment	State	1823 Rated capacity 1234			1701	387
Peoples Hospital Iowa City 1040—Johnson	Gen	NPA'ssn	30	8	117	18	782
Children's Hospital Iowa State Psychopathic	Unit of University Hospitals						
Hospital	Ment	State	50			35	372
Mercy Hospital University Hospitals	Gen	Church	100	15	280	69	1708
Iowa Falls 4112—Hardin Fiskworth Municipal Hosp	Gen	State	900	14	1417	774	9170
Keokuk 10106—Lee Craham Protestant Hosp	Gen	City	30	10	88	15	806
St Joseph's Hospital Knoville 4697—Marion	Gen	NPA'ssn	70	10	174	47	1050
Veterans Admin Facility Lake City 2012—Calhoun	Ment	Church	120	10	196	62	1074
McCrory Hospital McVay Memorial Hosp	Gen	Vet	1010			800	314
St Mary 478—Plymouth Sacred Heart Hospital	Gen	Indiv	30	10	51	11	529
	Gen	Part	16	5	40	10	347

## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Manning 1817—Carroll							
Wyatt Memorial Hospital	Gen	NP Assn	20	4	27	5	107
Maquoketa 8 595—Jackson							
City Memorial Hospital	Gen	Indiv	20	6	75	11	365
Marshalltown 17 373—Marshall							
Evangelical Deaconess Home and Hospital	Gen	Church	13½	20	270	102	2 816
St Thomas Mercy Hosp °	Gen	Church	70	10	112	29	1 015
Mason City, 23 304—Cerro Gordo							
Park Hospital	Gen	Corp	42	10	171	26	1 175
St Joseph's Mercy Hosp °	Gen	Church	83	12	212	56	1 606
Story Hospital	Gen	Part	10	3	28	4	130
McGregor 1 299—Clayton							
McGregor Hospital	Gen	Indiv	10	2	29	4	1 ½
Monticello 2 259—Jones							
John McDonald Hospital	Gen	NP Assn	30	8	124	16	5 ½
Mt Pleasant 3 743—Henry							
Mt Pleasant State Hosp	Mont Rated	State	1 453 capacity 1 640			1 471	511
Muscatine 16 778—Muscatine							
Bellevue Hospital	Gen	NP Assn	30	6	88	12	693
Benjamin Hershey Memorial Hospital	Gen	NP Assn	50	6	100	22	992
Nevada 3 133—Story							
Iowa Sanit and Hospital Gen	Gen	Church	3½	4	58	16	479
New Hampton 2 458—Chickasaw							
St Joseph's Hospital	Gen	Church	51	9	97	21	866
Newton 11 560—Jasper							
Mary Frances Skiff Memorial Hospital	Gen	City	43	9	233	21	986
Oakdale—Johnson							
State Sanatorium	TB	State	470			342	106
Oelwein 7 794—Fayette							
Mercy Hospital	Gen	Church	2½	5	117	15	666
Onawa 2 538—Monona							
Onawa Hospital	Gen	Indiv	10	2	4	2	274
Osceola 2 871—Clarke							
Harken Hospital	Gen	Indiv	20	6	24	8	349
Osceola Hospital	Gen	Part	20	3	42	8	302
Osceola Sanitarium	Gen	Indiv	10	3	3	3	38
Oskaloosa 10 123—Mahaska							
Mercy Hospital	Gen	Part	30	5	43	12	526
Ottumwa 28 070—Wapello							
Ottumwa Hospital	Gen	NP Assn	62	16	184	41	1 489
St Joseph Hospital °	Gen	Church	7½	12	145	46	1 493
Sunnyloft Sanatorium	TB	County	100			9½	118
Perry 5 881—Dallas							
Kings Daughters Hospital	Gen	NP Assn	2½	5	60	10	4 ½
Red Oak 5 718—Montgomery							
Murphy Memorial Hospital	Gen	City	14	7	102	10	409
Sheldon 3 320—O'Brien							
Sheldon Good Samaritan Hospital	Gen	Church	20	5	19	6	290
Shenandoah 6 002—Page							
Hand Memorial Hospital	Gen	NP Assn	2½	7	119	14	805
Sibley 18 0—Osceola							
Osceola Hospital	Gen	Part	18	6	38	5	306
Sibley Hospital	Gen	Indiv	18	4	No data		supplied
Sigourney 2 262—Keokuk							
Sigourney Hospital	Gen	Indiv	10	3	8	2	93
Slough City 79 183—Woodbury							
Lutheran Hospital °	Gen	Church	90	17	300	75	2 713
Methodist Hospital °	Gen	Church	120	18	324	76	3 185
St Joseph Mercy Hosp °	Gen	Church	200	20	402	116	4 4 8
St Vincent's Hospital °	Gen	Church	12½	14	291	79	3 997
Spencer 5 019—Clay							
Spencer Municipal Hospital	Gen	City	26	6	116	21	704
Spirit Lake 1 778—Dickinson							
Spirit Lake Hospital	Gen	Part	9	3	40	6	300
Toledo 1 823—Tama							
Sac and Cox Tuberculosis Sanatorium	TB	IA	94	3	7	69	1 ½
Vinton 3 32—Benton							
Virginia Gay Hospital	Gen	City	2½	6	84	13	590
Washington 4 814—Washington							
Washington County Hosp	Gen	County	3½	10	128	19	841
Waterloo 46 191—Black Hawk							
Allen Memorial Hospital	Gen	Church	115	10	309	57	1 797
Presbyterian Hospital	Gen	NP Assn	30	10	219	29	1 384
St Francis Hospital	Gen	Church	60	10	366	31	2 262
Waverly 2 632—Bremer							
St Joseph Mercy Hospital	Gen	Church	50	9	123	21	963
West Union 2 036—Fayette							
West Union Community Hospital	Gen	City	11	2	20	5	222
Williamburg 1 219—Iowa							
Miller Hospital	Gen	Indiv	10	2			
Related Institutions							
Ames 10 261—Story							
Iowa State College Hosp	Inst	State	90			19	901
Anamosa 3 1, 9—Jones							
Men's Reformatory Hosp	In t	State	20			6	375
Belmond 1 737—Wright							
Belmond Hospital	Gen	Indiv	12	5	2		
Bettendorf 2 563—Scott							
Masonic Sanitarium	Conv	Frat	6			47	12
Burlington 26 755—Des Moines							
Des Moines County Asylum	Mont	County	70			64	10
Council Bluffs 42 048—Pottawattamie							
Christian Home Hospital	In t	NP Assn	24			9	293
Iowa School for the Deaf							
Infirmiry	Inst	State	70				

Dr. Robert Telling ~~Library~~ on page 986

L. M. D. Medical College

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## IOWA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Davenport 607-1—Scott Iowa Soldiers Orphans Home Hospital	Inst	State	66			15	1 100
Des Moines 142-39—Polk Benedict Home	Mat	NPA's'n	30	4	23	23	23
Junior League Convalescent Home for Children	Conv	Corp	20			16	99
Salvation Army Women's Home and Hospital	Mat	Church	50	30	104	33	122
Eldora 3200—Hardin Iowa Training School for Boys Hospital	Inst	State	20			11	1 420
Ft Madison 13779—Lee Iowa State Penitentiary Hospital	Inst	State	40			18	314
Clenwood 4269—Mills Iowa Institution for Feeble minded Children	McDe	State	1851			1 500	90
		Rated capacity	1 600				
Harlan 3145—Shelby Harlan Hospital	Gen	Indiv	14	5	51	4	572
Indianola 3488—Warren Community Hospital	Gen	Indiv	6	3	22	2	66
Manchester 3413—Delaware Jones and Garling Hosp	Gen	Part	10	2	20	5	183
Mar halltown 1735—Marshall Iowa Soldiers Home Hosp	Inst	State	180			115	275
Odebolt 1385—Sae Odebolt Hospital	Gen	Indiv	10	3	15	3	61
Orange City 1727—Sioux De Bey Hospital	Gen	Part	6	1	12	3	57
Doornink Hospital	Gen	Indiv	6	1	7	3	159
Postville 1060—Allamakee Postville Community Hosp	Gen	Corp	13	3	34	9	223
Red Oak 5778—Montgomery Powell School for Backward and Nervous Children	McDe	Part	51			45	35
Sae City 2854—Sae Sae City Hospital	Gen	Indiv	10	3	16	3	255
Sioux City 7918—Woodbury Florence Crittenton Home	Mat	NPA's'n	55	25	62	37	97
Toledo 182—Tama State Juvenile Home Hosp	Inst	State	33			6	370
Waukon 2526—Allamakee Hall Hospital	Mat	Indiv	8	5	45	2	45
Rominger and Jeffries Emergency Hospital	Gen	Part	8			1	90
Winterset 2021—Madison Winterset Hospital	Gen	Indiv	14	5	55	8	410
Woodward 901—Dallas Hospital for Epileptics and School for Feeble minded	McDe	State	1 439			1 251	257
		Rated capacity	1 117				
<b>Summary for Iowa</b>							
Hospitals and sanatoriums	171	Beds	16 904	Average Census	12 912	Admissions	1 2 805
Related institutions	30		4 265		3 591		8 970
Totals	171		20 469		16 503		161 775
Refused registration	26		395				

## KANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Atchison 568—Dickinson Dickinson County Memorial Hospital	Gen	NPA's'n	30	6	100	13	825
Anthony 2947—Harper Community Hospital	Gen	Indiv	11	4		Estab 197	
Calloway Hospital	Gen	Indiv	35	7	85	55	756
Arlansas City 1946—Cowley Mercy Hospital	Gen	NPA's'n	25	12	185	19	760
Stricklen Hospital	Gen	NPA's'n	28	5	10	3	195
Atchison 13024—Atchison Atchison Hospital	Gen	NPA's'n	32	9	56	18	1 053
Augusta 4013—Butler Augusta Hospital	Gen	Indiv	11	3	17	5	189
Atchell 607—Marshall Atchell Hospital	Gen	Indiv	12	5	46	5	257
Belleville 235—Republic R C Patterson Memorial Hospital	Gen	Church	20	4	No data supplied		
Beloit 3562—Mitchell Community Hospital	Gen	NPA's'n	50	10	151	26	1 125
Chanute 1027—Neesho Johnson Hospital	Gen	Corp	50	6	59	22	927
Coffeyville 1610—Montgomery Medical Center	Gen	NPA's'n	18	6	64	9	684
Southeast Kansas Hospital	Gen	NPA's'n	25	4	50	8	47
Columbus 325—Cherokee Maude Norton Memorial City Hospital	Gen	City	15	2	2	8	252
Concordia 772—Cloud St Joseph's Hospital	Gen	Church	75	10	50	52	1 274
Dodge City 1065—Ford St Anthony Hospital	Gen	Church	65	15	151	47	1 000

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Eldorado 10311—Butler Susan B Allen Memorial Hospital	Gen	NPA's'n	43	7	217	50	1 177
Elkhart 1435—Morton Tucker Hospital	Gen	Indiv	18	2	6	3	47
Ellsworth 2042—Ellsworth Ellsworth Hospital	Gen	NPA's'n	35	5	108	27	1 016
Emporia 14667—Lyons Newman Memorial County Hospital	Gen	County	68	14	274	47	1 199
St Mary's Hospital	Gen	Church	75	10	77	25	1 557
Ft Leavenworth 492—Leavenworth Station Hospital	Gen	Army	182	5	43	105	7 051
Ft Riley 5579—Geary Station Hospital	Gen	Army	189	8	51	155	7 145
Ft Scott 10761—Bourbon Mercy Hospital	Gen	Church	110	12	117	65	7 71
Garden City 6121—Finney St Catherine's Hospital	Gen	Church	4	7	177	21	1 156
Girard 2412—Crawford Girard General Hospital	Gen	City	11	4	20	7	15
Goessel 250—Marion Menonite Bethesda Hosp	Gen	Church	16	6	6	11	98
Goodland 1626—Sheiman Boothroy Memorial Hosp	Gen	Church	25	3	57	9	315
Great Bend 148—Burton St Rose Hospital	Gen	Church	105	15	505	48	2 166
Halsstead 1375—Harvey Halstead Hospital	Gen	Church	150	8	12	100	3 051
Harper 1455—Harper Joslin Hospital	Gen	Indiv	10	4	6	5	7
Hays 4018—Hills Hays Protestant Hospital	Gen	Church	35	5	51	31	260
St Anthony's Hospital	Gen	Church	100	22	265	89	2 061
Herrington 4119—Dickinson Mercy Hospital	Gen	Part	50			1 545	1 194
Hillsboro 1458—Marion Salem Deaconess Hospital	Gen	Church	25	7	90	10	571
Hosington 1001—Barton Hosington Hospital	Gen	Indiv	14	2	16	7	257
Atchison Hospital	Gen	Indiv	14	2	16	7	257
Horton 4049—Brown Horton Hospital	Gen	Corp	25	6	115	16	879
Hutchinson 7708—Reno Grace Hospital	Gen	Church	125	18	27	71	2 551
St Elizabeth Mercy Hosp	Gen	Church	60	12	214	55	1 474
Independence 1252—Montgomery Mercy Hospital	Gen	Church	50	10	81	27	830
Junction City 740—Geary Junction City Municipal Hospital	Gen	City	52	8	91	12	455
Kansas City 12157—Wyandotte Bell Memorial Hospital	Gen	City	120	25	30	77	2 551
Bethany Methodist Hosp	Gen	Church	25	2	25	11	55
Douglas Hospital (col)	Gen	Church	50	10	14	14	14
Grandview Sanitarium	Gen	Indiv	50	10	14	14	14
Providence Hospital	Gen	Church	52	18	5	71	14
St Margaret's Hospital	Gen	Church	221	26	565	140	4 500
University of Kansas Hospitals	Gen	State	500	25	36	95	5 760
Larned 352—Pawnee Larned City Hospital	Gen	NPA's'n	15	3	7	6	575
Larned State Hospital	Gen	State	1 111			1 051	5 911
		Rated capacity	1 019				
Lawrence 1526—Douglas Lawrence Memorial Hosp	Gen	City	45	10	103	20	1 177
Leavenworth 1746—Leavenworth Cushing Memorial Hosp	Gen	NPA's'n	55	10	175	15	557
St John's Hospital	Gen	Church	65	10	50	50	557
Liberal 294—Neward Epworth Hospital	Gen	Church	42	9	48	17	455
Lyons 2930—Rice Lyons Hospital	Gen	NPA's'n	20	6	12	1	
Manhattan 10116—Riley Saint Mary Hospital	Gen	Church	42	8	76	0	71
Marquette 401—Marshall Randall Hospital	Gen	Indiv	12	5	9	5	25
Mulvane 1042—Sumner A T & S F Railway Hosp	Indus	NPA's'n	50				571
Newton 1054—Harvey Atchell Christian Hospital	Gen	Church	50	12	113	40	1 111
Bethel Deaconess Hospital	Gen	Church	47	12	155	1 111	
Norton 776—Norton Lathrop Hospital	Gen	Indiv	50	6	51	15	555
State Sanatorium for Tuberculosis	IB	State	250				
Oberlin 1629—Decatur Benton Memorial Hospital	Gen	Indiv	14	3	50	6	21
Olathe 4440—Miami Olathe Memorial Hospital	Gen	State	1 111			1 051	5 911
		Rated capacity	1 000				
Ottawa 957—Franklin Ransom Memorial Hospital	Gen	County	55	12	115	15	571
Parsons 1465—Iola Mercy Hospital	Gen	Church	35	5	87	17	657
M K T Railroad Employee Hospital	Indus	NPA's'n	50				571
State Hospital for Epileptics	Epil	State	545			571	115
		Rated capacity	545				
Pittsburg 1514—Crawford St Carmel Hospital	Gen	Church	75	5	10	40	1 177
Pratt 1514—Pratt Winnebago Hospital	Gen	Corp	20	5	16	14	557

Key to symbols and abbreviations is on page 985

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Quinter 300—Gove	Cen	NPAsen	10	4	No data supplied		
Quinter Hospital and Sanit	Cen	NPAsen	10	4	No data supplied		
Ransom 431—Ness	Gen	City	15	4	13	6	223
Grill Memorial Hospital	Gen	City	15	4	13	6	223
Sabetha 332—Venaha	Gen	Church	100	12	51	31	1 163
St Anthony Murdock Me	Gen	Church	100	12	51	31	1 163
morial Hospital	Gen	Church	100	12	51	31	1 163
Salina 2013—Saline	Cen	Church	51	9	179	42	1 383
Asbury Protestant Hosp	Gen	Church	50	13	178	36	1 300
St John's Hospital	Gen	Church	50	13	178	36	1 300
Spearville 705—Ford	Gen	NPAsen	10	3	10	6	233
Perkins Hospital	Gen	NPAsen	10	3	10	6	233
Stafford 1614—Stafford	Gen	Part	23	5	66	13	370
Feldburt Memorial Hospital	Gen	Part	23	5	66	13	370
Sterling 136—Rice	Cen	NPAsen	20	4	31	10	567
Sterling Hospital	Cen	NPAsen	20	4	31	10	567
Syracuse 1283—Hamilton	Cen	County	19	6	36	4	214
Donohue Memorial Hospital	Cen	County	19	6	36	4	214
Topeka 64170—Shawnee	Inpus	NPAsen	140			99	2 326
A T & S F Railway Hosp	Inpus	NPAsen	140			99	2 326
Christ's Hospital	Cen	Church	89	20	234	39	2 032
Hillcrest Sanatorium	FB	CyCo	70			60	148
Jane C Stormont Hosp	Cen	NPAsen	75	20	213	38	1 883
Veninger Sanitarium	NP	Corp	60			31	133
St Francis Hospital	Gen	Church	75	12	209	31	1 831
Topeka State Hospital	Vent	State	1 883			1 837	363
		Rated capacity	1 800				
Wadsworth—Leavenworth	Gen	Vet	734			33	4 189
Veterans Admin Facility	Gen	Vet	734			33	4 189
Wamego 1647—Pottawatomie	Cen	City	15	4	46	6	129
Genn Hospital	Cen	City	15	4	46	6	129
Wellington 740—Sumner	Cen	NPAsen	30	7	33	9	333
Hatcher Ho pital	Cen	NPAsen	30	7	33	9	333
St Luke's Hospital	Cen	NPAsen	20	8	93	10	612
Wichita 11110—Sedgwick	Gen	Indiv	13	2	19	6	263
Coffman Hospital	Gen	Indiv	13	2	19	6	263
St Francis Hospital	Gen	Church	273	23	611	181	6 030
Sedgwick County Hospital	Gen	County	76	1	20	37	1 873
Veterans Admin Facility	Gen	Vet	180			130	1 403
Wesley Hospital	Gen	Church	211	26	320	141	4 933
Wichita Hospital	Gen	Church	100	13	303	80	2 416
Winfield 938—Cowley	Gen	Church	43	6	102	33	1 099
St Mary's Hospital	Gen	Church	43	6	102	33	1 099
William Newton Memorial	Gen	City	37	10	173	36	1 081
Hospital	Gen	City	37	10	173	36	1 081
Related Institutions							
Ashland 1332—Clark	Gen	NPAsen	10	4	35	5	300
Ashland Hospital	Gen	NPAsen	10	4	35	5	300
Ellsworth 202—Ellsworth	Inst	State	32			20	93
Mother Bickerdyle Home	Inst	State	32			20	93
and Hospital	Inst	State	32			20	93
Ft Dodge 33—Ford	Inst	State	31			13	249
Kansas State Soldiers Home	Inst	State	31			13	249
Hospital	Inst	State	31			13	249
Ft Leavenworth 492—Leavenworth	Inst	Fed	173			101	1 772
U S Penitentiary Annex	Inst	Fed	173			101	1 772
Hospital	Inst	Fed	173			101	1 772
Lawrence 1726—Douglas	Inst	State	33			48	934
Haskell Institute Hospital	Inst	State	33			48	934
Watkins Memorial Hospital	Inst	State	33			48	934
Leavenworth 1446—Leavenworth	Inst	Fed	220			114	2 730
U S Penitentiary Ho pital	Inst	Fed	220			114	2 730
Little River 618—Rice	Gen	City	13	2	10	3	31
Hoffman Memorial Hospital	Gen	City	13	2	10	3	31
Manhattan 10136—Riley	Gen	City	13	2	10	3	31
Kansas State College Hosp	Gen	State	30			13	1 036
Nashville 234—Kingman	Cen	Indiv	9	2	30	3	174
Nashville Hospital	Cen	Indiv	9	2	30	3	174
Norwich 477—Kingman	Cen	Indiv	9	2	6	4	140
Norwich Hospital	Cen	Indiv	9	2	6	4	140
St Francis 914—Cheyenne	Cen	Indiv	10	1	14	4	20
St Francis Hospital	Cen	Indiv	10	1	14	4	20
Scott City 1344—Scott	Cen	NPAsen	11	4	33	3	33
Scott City Hospital	Cen	NPAsen	11	4	33	3	33
Topeka 64120—Shawnee	Mat	NPAsen	18	12	17	7	16
Florence Crittenton Home	Mat	NPAsen	18	12	17	7	16
State Industrial School for	In t	State	24			3	220
Boys	In t	State	24			3	220
Wichita 111110—Sedgwick	Mat	Church	69	19	76	4	103
Salvation Army Home and	Mat	Church	69	19	76	4	103
Hospital	Mat	Church	69	19	76	4	103
Sedgwick County Tubercu	TB	County	60			10	106
losis Sanitarium	TB	County	60			10	106
Suburban Rest Sanitarium	Conv	Indiv	30			10	106
Winfield 938—Cowley	MeDe	State	1 200			116	143
State Training School	MeDe	State	1 200			116	143
		Rated capacity	1 234				
Summary for Kansas							
Hospital and sanatoriums	Number	Beds	Average	Admi	lons		
Related institutions	97	12 240	9 720	114	194		
	19	2 120	1 333	9 790			
Totals	116	14 360	11 053	123	94		
Refused registration	30	638					

## KENTUCKY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Anchorage 564—Jefferson							
Hord's Sanitarium	N&M	Indiv	53			42	133
Ashland 2904—Boyd	Gen	NPAsen	75	12	243	58	2 035
Kings Daughters Hospital	Gen	NPAsen	75	12	243	58	2 035
Berea 1827—Madison	Gen	NPAsen	125	5	46	29	2 329
Berea College Hospital	Gen	NPAsen	125	5	46	29	2 329
Beverly 69—Bell	Gen	Church	9	4	31	4	130
Red Bird Evangelical Hosp	Gen	Church	9	4	31	4	130
Bowling Green 1233—Warren	Gen	City	43	8	88	13	1 114
City Hospital	Gen	City	43	8	88	13	1 114
Carlisle 1469—Nicholas	Gen	County	12	2	10	6	171
Johnson Memorial Hospital	Gen	County	12	2	10	6	171
Corbin 1806—Whitley	Gen	Indiv	25	3	5	10	429
Smith Hospital	Gen	Indiv	25	3	5	10	429
Covington 6323—Kenton	Gen	Church	231	35	823	192	5 164
St Elizabeth Hospital*	Gen	Church	231	35	823	192	5 164
Wm Booth Memorial Hosp	Gen	Church	94	18	246	40	1 173
Cynthiana 4386—Harrison	Gen	NPAsen	30	6	No data supplied		
Harrison Memorial Hospital	Gen	NPAsen	30	6	No data supplied		
Danville 6729—Boyle	Gen	NPAsen	30	6	No data supplied		
Danville and Boyle County	Gen	NPAsen	30	6	No data supplied		
Hospital	Gen	NPAsen	30	6	No data supplied		
Dayton 9071—Campbell	Gen	County	100	15	263	70	2 735
Speer's Memorial Hospital	Gen	County	100	15	263	70	2 735
Ft Knox 500—Hardin	Gen	Army	161	4	46	93	2 372
Station Hospital	Gen	Army	161	4	46	93	2 372
Ft Thomas (Newport P O)—Campbell	Cen	Army	142		1	39	1 316
Station Hospital	Cen	Army	142		1	39	1 316
Frankford 11626—Franklin	Gen	NPAsen	33	5	103	23	1 012
Kings Daughters Hospital	Gen	NPAsen	33	5	103	23	1 012
Georgetown, 4229—Scott	Gen	CyCo	24	6	30	17	558
John Graves Ford Memo	Gen	CyCo	24	6	30	17	558
rial Hospital	Gen	CyCo	24	6	30	17	558
Glasgow, 3042—Barren	Gen	NPAsen	31	8	32	33	2 117
T J Samson Community	Gen	NPAsen	31	8	32	33	2 117
Hospital	Gen	NPAsen	31	8	32	33	2 117
Harlan 4327—Harlan	Gen	Corp	75	6	48	40	1 923
Harlan Hospital	Gen	Corp	75	6	48	40	1 923
Harrodsburg 4029—Mercer	Gen	NPAsen	20	4	39	9	300
A D Price Memorial Hosp	Gen	NPAsen	20	4	39	9	300
Hazard 7021—Perry	Gen	Corp	73	8	30	35	2 078
Hazard Hospital	Gen	Corp	73	8	30	35	2 078
Hurst Snyder Ho pital	Gen	Corp	23	4	13	11	361
Henderson 11668—Henderson	Gen	NPAsen	42	8	34	22	1 820
Henderson Hospital	Gen	NPAsen	42	8	34	22	1 820
Hopkinsville 10764—Christian	Cen	Corp	29	3	33	27	1 133
Jennie Stuart Memorial	Cen	Corp	29	3	33	27	1 133
Hospital	Cen	Corp	29	3	33	27	1 133
Hyden 1471—Leslie	Gen	NPAsen	15	5	43	10	368
Frontier Nursing Service	Gen	NPAsen	15	5	43	10	368
Hospital	Gen	NPAsen	15	5	43	10	368
Jackson 2109—Breathitt	Gen	Indiv	20	3	No data supplied		
Bach Hospital	Gen	Indiv	20	3	No data supplied		
Jenkins 846—Letcher	Cen	NPAsen	63	6	8	30	530
Jenkins Hospital	Cen	NPAsen	63	6	8	30	530
Lebanon 3748—Marion	Gen	Indiv	10	3	22	5	333
Baute Infirmary	Gen	Indiv	10	3	22	5	333
Lexington 4373—Fayette	Gen	Church	200	15	304	164	6 033
Good Samaritan Hospital*	Gen	Church	200	15	304	164	6 033
High Oaks Sanatorium	N&M	Indiv	18			213	
Julius Marks Sanatorium	TB	County	94			93	119
St Joseph's Ho pital*	Cen	Church	197	22	331	121	6 707
Shrners Hospital for Crip	Orth	Frat	20			14	91
pled Children	Orth	Frat	20			14	91
U S Public Health Service	Drug	Fed	1 000			930	1 463
Hospital	Drug	Fed	1 000			930	1 463
Veterans Admin Facility	Ment	Vet	239			269	301
London 1930—Laurel	Gen	Corp	33	4	No data supplied		
Pennington General Hosp	Gen	Corp	33	4	No data supplied		
Louis 1961—Lawrence	Gen	Indiv	21	6	9	3	171
Louisa General Ho pital	Gen	Indiv	21	6	9	3	171
Riverview Hospital	Gen	Indiv	10	2	24		
Louisville 30774—Jefferson	Chli	NPAsen	73			63	688
Children's Free Hospital	Chli	NPAsen	73			63	688
Jewish Hospital	Cen	NPAsen	86	14	148	43	1 504
Kentucky Baptist Hosp*	Gen	Church	130	20	323	123	4 180
Kosair Crippled Children	Orth	NPAsen	63			37	320
Hospital	Orth	NPAsen	63			37	320
Louisville City Hospital**	Gen	City	328	38	940	404	11 196
Louisville Neuropathic Sanat	N&M	Corp	24			24	30
Methodist Episcopal Dea	Gen	Church	63	8	197	36	1 902
coness Hospital	Gen	Church	63	8	197	36	1 902
Norton Memorial Infirm*	Gen	NPAsen	120	20	301	68	2 06
Red Cross Hospital (col)	Gen	NPAsen	40	8	10	73	281
St Anthony's Hospital*	Gen	Church	138	23	343	109	3 193
St Joseph Infirmary*	Gen	Church	320	30	451	166	6 330
SS Mary and Elizabeth	Gen	Church	123	20	607	97	3 978
Hospital*	Gen	Church	123	20	607	97	3 978
State Tuberculo is Sanat	TB	State	63			61	183
Stokes Hospital	N&M	Indiv	40			24	30
U S Marine Hospital	Gen	USPHS	130			71	1 011
Lynch 7000—Harlan	Gen	Corp	30	4	108	23	1 136
Lynch Hospital	Gen	Corp	30	4	108	23	1 136
Vadonsville 6083—Hopkins	Gen	Corp	20	4	13	9	240
Madisonville Hospital	Gen	Corp	20	4	13	9	240
Martin 739—Floyd	Gen	Part	0	3	28	23	837
Beaver Valley Hospital	Gen	Part	0	3	28	23	837
Mayfield 8177—Graves	Gen	Corp	25	4	66	14	718
Fuller Gilliam Hospital	Cen	Corp	25	4	66	14	718
Mayfield Hospital	Gen	NPAsen	40	2	58	18	723
Maysville 6333—Mason	Gen	NPAsen	43	5	71	21	1 003
Hayswood Hospital	Gen	NPAsen	43	5	71	21	1 003
Middlesboro 10730—Bell							
Middlesboro Ho pital	Gen	Part	30	8	15	33	1 194

## REGISTERED HOSPITALS

JOUR. A. M.  
MARCH 26 19

## KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Murray 2 801—Calloway	Gen	Part	20	5	25	6	549
Keys Houston Clinic Hosp	Gen	NPAsn	100	5	47	26	706
Wm Mason Mem Hosp	Gen	City	37	10	222	2.0	1 047
Outwood—Christian	Gen	City	6	10	222	54	2 324
Veterans Admin Facility	G&TB Vet	Unit of Riverside Hospital					
Owensboro 22 76—Davies	Gen	City	37	10	222	2.0	1 047
Owensboro City Hospital	Gen	City	6	10	222	54	2 324
Paducah 33 541—McCracken	Gen	City	37	10	222	2.0	1 047
Ewart Purcell Isolation Hospital	Gen	City	37	10	222	2.0	1 047
Illinois Central Hosp (Registration suspended until July 1 1938)	Gen	NPAsn	95	5	32	1 440	
Riverside Hospital	Gen	City	110	8	220	21	1 324
Paintsville 2 411—Johnson	Gen	Corp	65	6	55	3	1 342
Paintsville Hospital	Gen	Corp	65	6	55	3	1 342
Paris 6 204—Bourbon	Gen	Corp	46	4	76	32	709
W W Massie Memorial Hospital	Gen	City	35	3	16	21	286
Pewee Valley 582—Oldham	Gen	NPAsn	45	5	41	34	1 631
Pewee Valley Sanitarium and Hospital	Gen	NPAsn	45	5	41	34	1 631
Pikeville 3 376—Pike	Gen	Church	2	2	15	1	406
Methodist Hospital	Gen	Church	2	2	15	1	406
Pineville 3 567—Bell	Gen	Corp	17	2	2	6	200
Pineridge Community Hosp	Gen	Corp	40	4	58	29	1 200
Richmond 6 490—Madison	Gen	NPAsn	23	8	60	17	613
Gibson Hospital	Gen	NPAsn	23	8	60	17	613
Pattie A Clay Infirmary	Gen	NPAsn	23	8	60	17	613
U S Public Health Service Trachoma Hospital	Trach	State	38			28	208
Shelbyville 4 033—Shelby	Gen	NPAsn	23	8	60	17	613
Kings Daughters Hospital	Gen	Corp	16	2	No data supplied		
Somerset 5 506—Pulaski	Gen	Corp	16	2	No data supplied		
Somerset General Hospital	Gen	Corp	16	2	No data supplied		
Versailles 2 244—Woodford	Gen	Corp	16	2	No data supplied		
Woodford Memorial Hosp	Gen	Corp	16	2	No data supplied		
Waverly Hills—Jefferson	Gen	Corp	16	2	No data supplied		
Waverly Hills Sanatorium	TB	Corp	520			490	504
Winchester 8 233—Clark	Gen	NPAsn	35	4	46	14	627
Clark County Hospital	Gen	NPAsn	20	3	1	7	183
Guerrant Clinic and Hospital	Gen	NPAsn	35	4	46	14	627
Related Institutions							
Barbourville 2 380—Knox	Gen	Indiv	20	2	12	6	270
Logan Hospital	Gen	Indiv	20	2	12	6	270
Fleming 1 389—Letcher	Indus	Corp	25		6	6	292
Fleming Hospital	Indus	Corp	25		6	6	292
Florence 4 50—Boone	Gen	Indiv	20	2	No data supplied		
Highway Medical Hospital	Gen	Indiv	20	2	No data supplied		
Frankfort 11 626—Franklin	Gen	Indiv	20	2	No data supplied		
State Institution for the Feeble-minded	MeDe	State	70			72	21
Fulton 3 502—Fulton	Gen	Part	10	2	74	7	346
Fulton Hospital	Gen	Part	10	2	74	7	346
Grayson 1 022—Carter	Gen	Corp	2	2	12	10	340
J Q Stovall Memorial Hosp	Gen	Corp	2	2	12	10	340
Hopkinsville 10 746—Christian	Gen	Corp	2	2	12	10	340
Western State Hospital	Gen	Corp	2	2	12	10	340
La Grange 1 121—Oldham	Gen	Part	10	2	74	7	346
State Prison Hospital	Gen	Part	10	2	74	7	346
Lakeland 55—Jefferson	Gen	Part	10	2	74	7	346
Central State Hospital	Gen	Part	10	2	74	7	346
Lexington 45 736—Fayette	Gen	Part	10	2	74	7	346
Eastern State Hospital	Gen	Part	10	2	74	7	346
Louisville 307 745—Jefferson	Gen	Part	10	2	74	7	346
Kings Daughters Home for Incurables	Gen	Part	10	2	74	7	346
Susan Speed Davis Home and Hospital	Gen	Part	10	2	74	7	346
Princeton 4 764—Caldwell	Gen	Part	10	2	74	7	346
Princeton Hospital	Gen	Part	10	2	74	7	346
Smiths Grove 718—Warren	Gen	Part	10	2	74	7	346
Lucy T Owen Hospital	Gen	Part	10	2	74	7	346
Summary for Kentucky							
Hospital and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	80	7 675	5 32	110 200			
Totals	14	7 379	7 200	4 648			
Refused registration	94	10 014	12 562	114 898			

## LOUISIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Alexandria 23 02—Rapides	Gen	Church	60	10	202	30	1 9
Baptist Hospital	Gen	Church	60	10	202	30	1 9
Veterans Admin Facility	Gen	Vet	60	10	202	30	1 9
Barndale Field—Boosier	Gen	Army	76	5	33	73	1 77
Station Hospital	Gen	Army	76	5	33	73	1 77
Bastrop 3 121—Morehouse	Gen	Indiv	2	4	2	5	34
Bastrop General Hospital	Gen	Indiv	2	4	2	5	34
Baton Rouge 30 729—East Baton Rouge	Gen	NPAsn	69	6	247	9	2 000
Baton Rouge General Hosp	Gen	NPAsn	69	6	247	9	2 000
Our Lady of the Lake Sanitarium	Gen	Church	12	1	4	80	4 402

## LOUISIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Bogalusa 14 029—Washington	Gen	Corp	82	12	208	86	3 000
Elizabeth Sullivan Memorial Hospital	Gen	Corp	82	12	208	86	3 000
Carville 308—Iberville	Gen	Corp	82	12	208	86	3 000
U S Marine Hospital	Gen	Corp	82	12	208	86	3 000
Converse 291—Sabine	Gen	Corp	82	12	208	86	3 000
Allen Sanitarium	Gen	Corp	82	12	208	86	3 000
Covington 3 208—St Tammany	Gen	Indiv	26	8	86	11	1 000
New Fenwick Sanitarium	Gen	Indiv	26	8	86	11	1 000
Crowley 7 636—Acadia	Gen	Indiv	64			15	1 000
Crowley Sanitarium	Gen	Indiv	64			15	1 000
Delhi 1 043—Richland	Gen	NPAsn	20	3	42	10	800
Delhi Clinic and Sanitarium	Gen	NPAsn	20	3	42	10	800
De Ridder 3 747—Beauregard	Gen	Part	13	1	8	2	104
De Ridder Sanitarium	Gen	Part	13	1	8	2	104
Ferriday 2 502—Concordia	Gen	Corp	16	1	18	2	1 100
Ferriday Hospital	Gen	Corp	16	1	18	2	1 100
Greenwell Springs—East Baton Rouge	Gen	Part	22	4	25	10	400
Greenwell Springs Sanat	Gen	Part	22	4	25	10	400
Haynesville 2 541—Caliborne	Gen	State	100			89	800
Haynesville Hospital	Gen	State	100			89	800
Houma 6 531—Terrebonne	Gen	NPAsn	20	2	20	7	400
Ellender Memorial Hospital	Gen	NPAsn	20	2	20	7	400
Jackson 3 966—East Feliciana	Gen	Part	16	4	61	10	800
East Louisiana State Hosp	Gen	Part	16	4	61	10	800
Parker Hospital	Gen	Part	16	4	61	10	800
Lafayette 14 035—Lafayette	Gen	State	4 000			3 407	800
Lafayette Charity Hospital	Gen	State	4 000			3 407	800
Lafayette Sanitarium	Gen	State	4 000			3 407	800
Lake Charles 10 791—Calcasieu	Gen	Corp	240	12	41	5	1 000
St Patrick's Hospital	Gen	Corp	240	12	41	5	1 000
Lecompte 1 247—Rapides	Gen	Church	75	10	100	40	1 000
Lecompte Sanitarium	Gen	Church	75	10	100	40	1 000
Mansfield 3 837—De Soto	Gen	Part	25	2	80	4	1 000
Mansfield Sanitarium	Gen	Part	25	2	80	4	1 000
Minden 5 023—Webster	Gen	Corp	32	2	37	0	400
Minden Sanitarium	Gen	Corp	32	2	37	0	400
Monroe 26 029—Ouachita	Gen	Corp	32	4	70	11	700
Riverside Sanitarium	Gen	Corp	32	4	70	11	700
St Francis Sanitarium	Gen	Corp	32	4	70	11	700
Vaughan Wright Bendel Clinic	Gen	Indiv	20	4	60	10	600
New Iberia 8 003—Iberia	Gen	Church	125	15	203	66	3 400
Dauterive Hospital	Gen	Church	125	15	203	66	3 400
Iberia General Hospital	Gen	Church	125	15	203	66	3 400
New Orleans 4 587—Orleans	Gen	Indiv	20	3	60	8	700
Charity Hospital	Gen	Indiv	20	3	60	8	700
City Hospital for Mental Diseases	Gen	State	1 000	68	1 770	1 740	21 000
Delgado Memorial Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Do Paul Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
Eye Ear Nose and Throat Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Flint Goodridge Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Billard University (col)	Gen	State	1 000	68	1 770	1 740	21 000
French Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Hotel Dieu Sisters Hosp	Gen	State	1 000	68	1 770	1 740	21 000
Illinois Central Hospital	Gen	State	1 000	68	1 770	1 740	21 000
John Dibert Memorial Tuberculosis Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Mercy Hospital	Gen	State	1 000	68	1 770	1 740	21 000
New Orleans Hospital and Dispensary for Women and Children	Gen	State	1 000	68	1 770	1 740	21 000
Richard Miliken Memorial Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Southern Baptist Hosp	Gen	State	1 000	68	1 770	1 740	21 000
Touro Infirmary	Gen	State	1 000	68	1 770	1 740	21 000
U S Marine Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Opelousas 6 200—St Landry	Gen	State	1 000	68	1 770	1 740	21 000
St Rita's Infirmary	Gen	State	1 000	68	1 770	1 740	21 000
Pineville 2 612—Rapides	Gen	State	1 000	68	1 770	1 740	21 000
Central Louisiana State Hosp	Gen	State	1 000	68	1 770	1 740	21 000
Plaquemine 1 104—Iberville	Gen	State	1 000	68	1 770	1 740	21 000
Plaquemine Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
Ruston 4 400—Lincoln	Gen	State	1 000	68	1 770	1 740	21 000
Ruston Lincoln Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
Shreveport 76 600—Caddo	Gen	State	1 000	68	1 770	1 740	21 000
Gowen Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
Highland Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
North Louisiana Sanit	Gen	State	1 000	68	1 770	1 740	21 000
Pine Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
T F Schumpert Memorial Sanitarium	Gen	State	1 000	68	1 770	1 740	21 000
Shreveport Charity Hosp	Gen	State	1 000	68	1 770	1 740	21 000
Shriners Hospital for Crippled Children	Gen	State	1 000	68	1 770	1 740	21 000
Tri State Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Tallulah 2 222—Madison	Gen	State	1 000	68	1 770	1 740	21 000
Tallulah Hospital and Clinic	Gen	State	1 000	68	1 770	1 740	21 000
Thibodaux 4 447—La Fourche	Gen	State	1 000	68	1 770	1 740	21 000
Stoph Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Winneshboro 1 400—Franklin	Gen	State	1 000	68	1 770	1 740	21 000
Rogers Clinic and Hospital	Gen	State	1 000	68	1 770	1 740	21 000
Related Institutions							
Alexandria 2 022—Rapides	Gen	State	1 000	68	1 770	1 740	21 000
State Colony and Training School	Gen	State	1 000	68	1 770	1 740	21 000
Angola 1 200—West Feliciana	Gen	State	1 000	68	1 770	1 740	21 000
Louisiana State Penitentiary	Gen	State	1 000	68	1 770	1 740	21 000

Key to symbols and abbreviations is on page 985

## LOUISIANA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Breaux Bridge 1399—Saint Martin St Paul Hospital	Gen	Indiv	10	1	1	2	129
Elizabeth 3000—Allen Industrial Lumber Company Hospital	Indus	NPA's'n	20	1		3	22
Hodge 1367—Jackson Hodge Clinic	Gen	Indiv	8	2	32	4	234
New Orleans 438 762—Orleans New Orleans Convale cent Home	Conv	NPA's'n	30			10	236
Orleans Tuberculosis Hosp	TB	NPA's'n	100			47	103
Opelousas 6289—St Landry St Landry Sanitarium	Gen	Indiv	15	3	44	4	301
Winnboro 1965—Franklin Winnboro Sanitarium	Gen	Corp	25	3	10	10	47
Summary for Louisiana			Number	Beds	Average Census	Admissions	
Hospitals and sanatoriums			57	13 836	11 496	142 888	
Related institutions			9	1 111	842	2 611	
Totals			66	14 947	12 338	145 499	
Refused registration			3	32			

## MAINE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Augusta 17 198—Kennebec Augusta General Hospital	Gen	NPA's'n	65	15	170	36	1 449
Augusta State Hospital	Gen	State	1 483			1 465	297
		Rated capacity	1 200				
Bangor, 28 749—Penobscot Bangor Sanatorium	TB	NPA's'n	30			21	24
Bangor State Hospital	Gen	State	1 141			1 085	318
		Rated capacity	1 106				
Eastern Maine General Hospital	Gen	NPA's'n	159	14	96	159	4 150
Palme Private Hospital	Gen	Indiv	25	5	11	10	272
Bar Harbor 4 486—Hancock Mount Desert Island Hosp	Gen	NPA's'n	35	6	40	22	866
Bath 9 110—Sagadahoc Bath Memorial Hospital	Gen	NPA's'n	50	10	92	30	733
Belfast 4 993—Waldo Bradbury Memorial Hosp	Gen	NPA's'n	15	5	8	5	104
Waldo County General Hospital	Gen	NPA's'n	32	6	49	22	587
Biddeford 17 633—York Trull Hospital	Gen	Corp	40	10	122	34	888
Webber Hospital	Gen	NPA's'n	54	13	235	46	1 506
Blue Hill 1 439—Hancock Blue Hill Memorial Hosp	Gen	NPA's'n	25	8	55	11	255
Boothbay Harbor 2 076—Lincoln St Andrews Hospital	Gen	Corp	20	4	1	5	368
Brunswick 6 144—Cumberland Brunswick Hospital	Gen	Indiv	46	6	39	27	575
Calais 5 440—Washington Calais Hospital	Gen	Indiv	52	5	75	31	836
Cape Cottage 60—Cumberland Station Hospital	Gen	Army	42			39	1 127
Caribou 7 248—Aroostook Cary Memorial Hospital	Gen	City	40	10	95	21	793
Castine 726—Hancock Castine Community Hosp	Gen	NPA's'n	12	6		No data supplied	
Ellsworth 3 657—Hancock Hurley Private Hospital	Gen	Corp	12	5	27	5	220
Fairfield 3 529—Somerset Central Maine Sanatorium	TB	State	156			182	106
Farmington 1 737—Franklin Franklin County Memorial Hospital	Gen	NPA's'n	50	10	59	21	849
Ft Fairfield 2 616—Aroostook Ft Fairfield Clinic	Gen	Corp	18	6	41	10	466
Gardiner 5 609—Kennebec Gardiner General Hospital	Gen	NPA's'n	45	12	220	22	1 040
Greenville Junction 34—Piscataquis Charles A Dean Hospital	Gen	NPA's'n	23	5	33	9	603
Greenwood Mountain—Oxford Western Maine Sanatorium	TB	State	150			141	161
Houlton 6 865—Aroostook Aroostook Hospital	Gen	Corp	40	12	120	28	919
Madigan Memorial Hosp	Gen	Church	33	7	84	24	899
Island Falls 1 455—Aroostook Emma V Milliken Memorial Hospital	Gen	NPA's'n	11	6		Estab	1937
Lebanon 34 948—Androscoggin Central Maine General Hospital	Gen	NPA's'n	156	28	458	151	3 737
St Mary's General Hosp	Gen	Church	150	12	235	105	3 112
Portland 6 910—Cumberland Children's Hospital	Child	NPA's'n	100			69	450
Larrington Hospital	Gen	City	150	16	250	156	1 833
Dr Leighton's Private Hosp	GynOb	Indiv	14	12	80	9	407
Maine Eye and Ear Infirmary	Gen	NPA's'n	100	20	355	93	3 020
Maine General Hospital	Gen	NPA's'n	264	27	451	206	5 675
Queen's Hospital	Gen	Church	48	12	99	31	663
St Barnabas Hospital	Gen	Indiv	75	15		No data supplied	
State Street Hospital	Gen	Corp	0	12	75	44	1 154
U S Marine Hospital	Gen	USPHS	72			53	494

## MAINE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Presque Isle 4 602—Aroostook Northern Maine Sanat	TB	State	119			115	103
Presque Isle General Hosp	Gen	NPA's'n	50	10	100	31	1 198
Rockland 9 055—Knox Knox County General Hospital	Gen	NPA's'n	70	7	66	32	966
Rumford 10 340—Oxford Rumford Community Hospital	Gen	Corp	75	8	166	35	1 489
Sanford 13 392—York Henrietta D Goodall Hosp	Gen	NPA's'n	50	8	77	27	1 047
Skowhegan 6 433—Somerset Kennebec Valley Hospital	Gen	Indiv	37	5		No data supplied	
Togus 2 350—Kennebec Veterans Admin Facility	Gen	Vet	294			225	1 948
Waterville 15 454—Kennebec Elm City Hospital	Gen	Indiv	35	6	77	26	728
Sisters Hospital	Gen	Church	90	10	151	50	2 656
Thayer Hospital	Gen	Corp	32	5	90	25	1 166
Westbrook 10 807—Cumberland Westbrook Hospital	Gen	Corp	22	7	74	9	487
York Village 500—York York Hospital	Gen	NPA's'n	20	7	50	6	316

## Related Institutions

Auburn 18 571—Androscoggin Auburn Private Hospital	Gen	Indiv	12	5	40	5	150
Bangor 28 749—Penobscot Friendship Hospital	Gen	Indiv	12	2	8	5	133
Gay Private Hospital	N&M	Indiv	18			14	168
Stinson Private Hospital	Gen	Indiv	18	12		No data supplied	
Bar Mills 500—York Buxton Hollis Hospital	Gen	Indiv	12	2	10	2	130
Bridgton 2 659—Cumberland Northern Cumberland Memorial Hospital	Gen	NPA's'n	6	3	19	2	83
Eagle Lake 1 780—Aroostook Northern Maine Gen Hosp	Gen	Church	42			34	640
East Parsonfield 135—York Restland	Conv	Indiv	50			15	23
Lubec 1 500—Washington Metcalf Hospital	Gen	Indiv	8	3	15	3	145
Portland 70 810—Cumberland Dr C P Wescott Sanatorium	Conv	Indiv	14			9	42
Shadow Lawn							
Pownall 462—Cumberland Pownall State School	McDe	State	998			788	111
		Rated capacity	1 120				
Union 1 060—Knox Jones Sanitarium	N&M	Corp	30			15	21

Summary for Maine	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	51	5 988	5 103	54 541
Related institutions	12	1 342	902	2 018
Totals	63	7 330	6 005	56 559
Refused registration	6	116		

## MARYLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Aberdeen Proving Ground 215—Harford Station Hospital	Gen	Army	12			4	125
Annapolis 12 531—Anne Arundel Annapolis Emergency Hosp	Gen	NPA's'n	85	15	254	50	1 842
U S Naval Hospital	Gen	Navy	224			80	1 519
Baltimore 894 874—Baltimore City Baltimore City Hospitals	Gen	City	1 200	60	1 587	1 060	7 657
Baltimore City Psychopathic Hospital							
Baltimore City Tuberculosis Hospital							
Baltimore Eye Far and Throat Charity Hospital	ENT	NPA's'n	60			31	2 550
Bon Secours Hospital	Gen	Church	118	25	599	86	2 914
Children's Hospital School	Orth	NPA's'n	120			89	268
Church Home and Infirmary	Gen	Church	164	22	249	100	2 872
Franklin Square Hosp	Gen	NPA's'n	172	32	263	88	2 656
Good Shepherd General Hospital (col)	Gen	Corp	50	5	17	14	150
Gundry Sanitarium	N&M	Indiv	45			42	41
Hospital for Women	Gen	NPA's'n	104	24	353	77	2 195
Howard A Kelly Hospital	SkCa	Corp	27			6	191
James Lawrence Kernan Hospital and Industrial School for Crippled Children	Orth	NPA's'n	80			70	167
Johns Hopkins Hosp	Gen	NPA's'n	853	72	1 756	674	16 750
Johnston Memorial Children's Hospital							
Maryland General Hosp	Gen	Church	240	21	554	177	4 541
Mercy Hospital	Gen	Church	25	25	30	250	818
Mount Hope Retreat	N&M	Church	600			555	126
Phipps Psychiatric Clinic							
Prebyterian Eye Ear and Throat Charity Hospital	ENT	Church	40			9	2 250



## MARYLAND—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Provident Hospital and Free Dispensary (col)*+o	Gen	NPA'ssn	129	9	1,08	98	1,733
St Agnes Hospital*+o	Gen	Church	188	25	291	12	3,830
St Joseph's Hospital*+o	Gen	Church	235	35	647	160	5,722
Sinal Hospital*+o	Gen	NPA'ssn	243	40	752	195	5,757
South Baltimore General Hospital*+o	Gen	NPA'ssn	115	10	24	92	2,914
Sydenham Hospital	Iso	City	110			71	1,637
Union Memorial Hospital*+o	Gen	NPA'ssn	321	24	437	226	6,141
U S Marine Hospital*	Gen	USPHS	440			363	3,748
University Hospital*+o	Gen	State	400	50	1,001	379	9,040
Volunteers of America Hospital	Gen	NPA'ssn	35	16	351	25	1,218
West Baltimore General Hospital*+o	Gen	Corp	165	35	508	104	3,440
Cambridge 8544—Dorchester	Gen	NPA'ssn	15		204	33	1,137
Cambridge Maryland Hosp o	Gen	State	366			337	121
Eastern Shore State Ho p	Ment	State	425				
Rated capacity 1,729							
Catonsville 7646—Baltimore	N&M	Indiv	35		18		61
Harlem Lodge	Ment	State	1818		1,775		564
Spring Grove State Hosp +							
Rated capacity 1,729							
Chestertown 2809—Kent	Gen	NPA'ssn	22	6	35		221
Kent and Upper Queen Anne's General Hospital							
Crisfield 3850—Somerset	Gen	County	35	5	60	16	450
Edward W McCready Memorial Hospital							
Crowsville (Waterbury P O)—Anne Arundel	Ment	State	1,710			1,186	545
Crowsville State Hospital (col)							
Rated capacity 1,000							
Unit of Crowsville State Hospital							
Hospital for Colored Feeble minded Children							
Cumberland 37747—Allegany	Gen	Church	115	20	428	69	2,312
Allegany Hospital of the Sisters of Charity	Gen	Cy Co	150	30	321	115	3,316
Easton 4092—Talbot	Gen	NPA'ssn	95	19	239	66	2,197
Emergency Hospital							
Edgewood 700—Harford	Gen	Army	56		4	22	789
Station Hospital							
Elkton 3331—Cecil	Gen	NPA'ssn	45	8	175	31	1,128
Union Hospital of Cecil County							
Ellicott City 1216—Howard	N&M	Corp	20		14		72
Patapsco Manor Sanitarium							
Ft George G Meade—Anne Arundel	Gen	Army	87	4	31	76	972
Station Hospital							
Ft Howard 505—Baltimore	Gen	Army	27	1	3	29	681
Station Hospital							
Ft Washington 415—Prince Georges	Gen	Army	28		7		261
Station Hospital							
Frederick 14434—Frederick	Gen	County	50	10	114	35	547
Emergency Hospital	Gen	NPA'ssn	113	12	165	52	1,814
Frederick City Hospital							
Frostburg 5588—Allegany	Gen	State	59	10	179	22	794
Miners Hospital							
Hagerstown 30861—Washington	Gen	NPA'ssn	150	18	258	95	3,922
Washington County Hosp o							
Harre de Grace 398—Harford	Gen	NPA'ssn	42	8	No data supplied		
Harford Memorial Hosp							
Henrytown 27—Carroll	TB	State	276			219	326
Maryland Tuberculosis Sanatorium (col)							
Ijamsville 72—Frederick	N&M	Indiv	50		20	29	
Riggs Cottage Sanitarium							
Laurel 2532—Prince Georges	N&M	Indiv	75		66		336
Laurel Sanitarium							
Mt Wilson—Baltimore	TB	State	175			176	119
Mt Wilson Branch Maryland Tuberculosis Sanat							
Oney 83—Montgomery	Gen	NPA'ssn	40	8	143	35	1,305
Montgomery County General Hospital							
Perry Point 80—Cecil	Ment	Vet	1,000			1,693	500
Veterans Admin Facility							
Prince Frederick 200—Calvert	Gen	County	35	5	56	10	411
Calvert County Hospital							
Reisterstown 1635—Baltimore	TB	NPA'ssn	60			53	49
Ut Pleasant							
Relay 2016—Baltimore	N&M	Part	40			17	95
Relay Sanitarium							
Rockville 1422—Montgomery	N&M	Indiv	45		25		94
Chestnut Lodge Sanitarium							
Salisbury 1077—Wicomico	TB	State	75			37	117
Maryland Tuberculosis Sanatorium	Gen	NPA'ssn	90	14	253	77	2,660
Peninsula General Hosp o							
State Sanatorium 260—Frederick	TB	State	510			503	691
Maryland Tuberculosis Sanatorium							
Skiesville 661—Carroll	Ment	State	252			2,655	651
Springfield State Hosp +							
Rated capacity 2,747							
Towson 2074—Baltimore	Conv	Indiv	25			18	82
Albion Manor							
Hospital for Consumptive (Eudwood Sanatorium)	TB	NPA'ssn	100			19	247
Sheppard and Fnoch Pratt Hospital*+o	N&M	NPA'ssn	25			29	357

## MARYLAND—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Baltimore 804874—Baltimore City	Inst	City	25			19	429
Baltimore City Jail Hosp							
Happy Hills Convalescent	Conv	NPA'ssn	60			40	291
Home for Children	Inc	NPA'ssn	119			119	91
Home for Incurables							
Maryland Penitentiary Hospital	Inst	State	41			73	304
Cumberland 37747—Allegany	TB	NPA'ssn	24			10	51
Allegany County Tuberculosis Sanatorium							
Jessups 161—Anne Arundel	Inst	State	47			91	83
Maryland House of Correction Hospital							
Leonardtown 697—St Marys	Gen	NPA'ssn	32	6	66	9	54
St Marys County Hospital							
Owning Mills 215—Baltimore	McDe	State	1,110			1,056	13
Rosewood State Training School							
Rated capacity 1,000							
Sparrow Point—Baltimore	Indus	Corp	20				
Emergency Hospital Bethlehem Steel Company							
Summary for Maryland							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	67	17,229	14,845	1,079,73			
	9	1,550	1,357	9,495			
Totals	76	19,079	16,182	1,079,73			
Refused registration	4	76					

## MASSACHUSETTS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Acushnet (New Bedford P O), 4092—Bristol	Gen	NPA'ssn	35	6	100	91	417
Acushnet Ho pital							
Adams 12697—Berkshire	Gen	City	50	15	190	25	890
W D Plunkett Memorial Hospital							
Aldenville (Chicopee Falls P O)—Hampden	Gen	Indiv	25	6	38	24	477
Chicopee Ho pital							
Amherst 11890—Essex	Gen	City	30	6	85	18	1,113
Amherst Hospital							
Arlington 36694—Middlesex	N&M	Corp	60			38	96
Ring Sanatorium and Hosp o	Gen	NPA'ssn	80	21	194	45	1,414
Symmes Arlington Hosp o							
Attleboro 21789—Bristol	TB	County	65	24	51	54	146
Bristol County Tuberculosis Hospital							
Sturdy Memorial Ho pital	Gen	NPA'ssn	101	24	51	47	1,500
Ayer 3600—Middlesex	Gen	NPA'ssn	2	7	81	11	253
Community Memorial Hosp							
Bedford 2600—Middlesex	Ment	Vet	1,116			851	661
Veterans Admin Facility							
Belmont 21745—Middlesex	N&M	NPA'ssn	237			212	265
McLenn Hospital*+o							
Beverly 25056—Essex	Gen	NPA'ssn	121	20	361	111	399
Beverly Hospital*+o							
Boston 68158—Suffolk	Gen	NPA'ssn	75			91	60
Adams House (Nervine)	Gen	NPA'ssn	220			15	1,111
Bath Israel Hospital*+o	Gen	NPA'ssn	246	148	375	1,000	497
Boston City Hospital*+o	Gen	City	50			4	1,243
Boston Floating Hospital*+o	Chil	NPA'ssn	150	150	2,511	71	2,219
Boston Lying in Hosp +o	Ment	State	79			71	913
Boston Psychopathic Hosp +							
Rated capacity 1,000							
Boston State Hospital+	Ment	State	2,768			2,717	883
Rated capacity 2,100							
Carner Hospital*+o	Gen	Church	186	24	37	141	405
Channing Home	TB	NPA'ssn	27			25	47
Children's Hospital*+o	Chil	NPA'ssn	28			152	45
Colby P Huntington Memorial Hospital*	SkCa	NPA'ssn	20			14	121
Finerson Hospital	Gen	Corp	25	10	74	15	423
Frangeline Booth Maternity Hospital and Home	Mat	Church	7	5	5	9	99
Faulkner Hospital*+o	Gen	NPA'ssn	141	21	18	1	2,915
Clevidence Hospital	N&M	Corp	85			84	197
Harley Private Ho pital	Gen	Corp	62	21	210	21	89
House of the Good Samaritan	Card	NPA'ssn	80			71	147
Infants' Hospital	Chil	NPA'ssn	4			2	10
Jewish Memorial Hospital	Chr	NPA'ssn	9			45	140
Joseph H Pratt Diagnostic Hospital+	Gen	NPA'ssn	62	4	47	5	216
Long Island Hospital*	Gen	City	612				
Ma achu etts Eye and Ear Infirmary+	FNT	NPA'ssn	51			146	2,716
Ma achu etts General Ho pital*+o	Gen	NPA'ssn	424			77	51
Massachusetts General Ho pital	Gen	NPA'ssn	215	46	77	604	73
The Baker Memorial Hospital	Gen	NPA'ssn	107	2	17	71	2
Massachusetts General Ho pital Phillips House							
Ma achu etts Memorial Ho pital*+o	Gen	NPA'ssn	54			91	11
Massachusetts Women's Ho pital	Gen	NPA'ssn	67	90	2	4	1,53
New England Baptist Ho p o	Gen	NPA'ssn	250	2	19	15	1,111
New England Deaconess Hospital*+o	Gen	Church	50			25	77

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
New England Hospital for Women and Children*	Gen	NPAsn	180	70	1,424	168	5,209
Palmer Memorial Hospital	Unit of New England Deaconess Hospital						
Peter Bent Brigham Hospital**	Gen	NPAsn	247			193	4,714
Robert Breck Brigham Hospital	Chr	NPAsn	110			86	963
Robert Dawson Evans Memorial*	Unit of Massachusetts Memorial Hospitals						
St Elizabeth's Hospital*	Gen	Church	200	50	876	161	4,812
St Margaret's Hospital	Gen	Church	60	70	466	40	1,411
St Mary's Maternity Hosp	Match	Church	40	12	133	23	100
Sanatorium Division of Boston City Hospital*	TB	City	616			551	500
Vincent Memorial Hospital	Gen	NPAsn	21			16	300
Bridgewater 900—Plymouth	Ment	State	916			881	77
Bridgewater State Hospital			Rated capacity 982				
Brockton 63 707—Plymouth							
Brockton Hospital*	Gen	NPAsn	120	20	380	96	2,746
Goddard Hospital	Gen	Corp	50	10	309	49	1,941
Moore Hospital	Gen	Indiv	20	8	63	20	480
Brookline 47 400—Norfolk							
Bellvue Hospital	Gen	Corp	30	6	26	13	317
Bournwood Hospital	Nerv	Indiv	18			10	2
Brooks Hospital	Gen	Corp	43			38	1,227
Free Hospital for Women*	Gyn	NPAsn	101			74	2,274
Trumbull Hospital	Gen	NPAsn	50	11	97	32	1,174
Cambridge 113 643—Middlesex							
Cambridge City Hospital*	Gen	City	202	32	600	173	5,723
Cambridge Hospital**	Gen	NPAsn	200	56	888	130	4,244
Cambridge Sanatorium	TB	City	80			70	60
Charlesgate Hospital	Gen	Corp	80	10	120	20	1,030
Chester Hospital	Gen	Corp	40	20	137	10	381
Canton 5 816—Norfolk							
Massachusetts Hosp School	Orth	State	300			208	329
Chelsea 40 816—Suffolk							
Captain John Adams Hospital at Soldiers Home*	Gen	State	202			278	1,942
Chelsea Memorial Hosp	Gen	Corp	85	20	360	60	1,944
U S Marine Hospital	Gen	USPHS	200			183	1,966
U S Naval Hospital*	Gen	Navy	330			243	2,471
Clinton 12 817—Worcester							
Clinton Hospital	Gen	NPAsn	60	20	215	20	1,170
Concord 7 44—Middlesex							
Emerson Hospital	Gen	NPAsn	38	12	177	18	744
Valleyhead	Nerv	Indiv	20			12	132
Danvers 12 957—Essex							
Hunt Memorial Hospital	Gen	City	20	6	70	8	510
Everett 48 494—Middlesex							
Whidden Memorial Hosp	Gen	NPAsn	90	20	403	78	2,541
Fall River 110 274—Bristol							
Fall River General Hosp	G&TB	City	201			206	2,389
St Anne's Hospital*	Gen	Church	100	26	260	50	1,870
Truesdale Hospital*	Gen	NPAsn	124	16	289	77	2,721
Union Hospital*	Gen	NPAsn	172	30	436	100	3,187
Fitchburg 40 692—Worcester							
Burbank Hospital*	Gen	Corp	108	22	540	150	4,115
Forest Hills (Boston P O)—Suffolk							
Forest Hills General Hosp	Gen	NPAsn	100	36	No data supplied		
Ft Devens (Ayer P O)—Middlesex							
Station Hospital	Gen	Army	117			66	1,813
Foxboro 5 847—Norfolk							
Foxboro State Hospital*	Ment	State	1,342			1,297	319
			Rated capacity 1,500				
Framingham 27 210—Middlesex							
Framingham Union Hosp*	Gen	NPAsn	130	30	396	60	2,429
Gardner 19 999—Worcester							
Gardner State Hospital*	Ment	State	1,066			1,096	174
			Rated capacity 1,100				
Henry Heywood Memorial Hospital*	Gen	NPAsn	81	19	371	60	2,121
Cloucester 21 204—Essex							
Addison Gilbert Hospital*	Gen	NPAsn	80	15	234	55	1,920
Great Barrington 5 904—Berkshire							
Fairview Hospital	Gen	NPAsn	49	15	113	19	631
Greenfield 15 00—Franklin							
Franklin County Public Hospital*	Gen	NPAsn	87	22	281	67	1,700
Groton 2 434—Middlesex							
Groton Hospital	Gen	Indiv	14	4	26	8	296
Hathorne 1 11—Essex							
Danvers State Hospital*	Ment	State	2,714			2,203	963
			Rated capacity 1,860				
Haverhill 48 710—Essex							
Benon Hospital	Gen	Indiv	26	2	13	17	400
Haverhill Municipal Hospital (Hale)	Cen	City	106	30			New building
Haydenville 1 900—Hampshire							
Hampshire County Sanat	TB	County	80				102
Holbrook 0 2—Norfolk							
Flmhurst Hosp and Sanit	Gen	Indiv	10			8	112
Holden 3 57—Worcester							
Holden District Hospital	Gen	NPAsn	30	6	79	20	906
Holyoke 50 557—Hampden							
Holyoke Hospital*	Gen	NPAsn	106	24	286	66	1,887
Holyoke Tuberculosis Sanat	TB	City	18			29	29
Providence Hospital*	Gen	Church	168	32	589	123	5,899
Hyannis 1 800—Barnstable							
Cape Cod Hospital	Gen	NPAsn	65	10	242	48	1,784
Ipswich 1 099—Essex							
Benjamin Stickney Cable Memorial Hospital	Gen	NPAsn	30	7	90	13	403
Lawrence 8 068—Essex							
Bessie Burke Memorial Hospital	Gen	City	120	12	190	90	2,374

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Clover Hill Hospital	Gen	Corp	28	8	241	20	1,031
Lawrence General Hosp**	Gen	NPAsn	130	20	325	89	3,002
Leominster 21 810—Worcester							
Leominster Hospital*	Gen	NPAsn	61	12	190	36	1,499
Lowell 100 234—Middlesex							
Lowell General Hospital*	Gen	NPAsn	100	30	333	81	2,926
St Johns Hospital*	Gen	Church	160	27	316	111	3,302
St Joseph's Hospital*	Gen	Church	105	17	337	94	4,060
Shaw Hospital	Gen	Indiv	16	12	75	8	297
Ludlow 8 876—Hampden							
Ludlow Hospital	Gen	NPAsn	30	14	182	16	696
Lynn 102 370—Essex							
Lynn Hospital*	Gen	NPAsn	172	46	561	131	4,916
Union Hospital	Gen	NPAsn	61	22	437	47	1,606
Malden 28 006—Middlesex							
Malden Hospital*	Gen	Corp	187	30	601	100	4,000
Marblehead 8 668—Essex							
Mary A Alley Emergency Hospital	Gen	City	15	8	71	9	476
Marlboro 10 287—Middlesex							
Marlboro Hospital	Gen	NPAsn	62	23	200	37	1,902
Medfield 4 066—Norfolk							
Medfield State Hospital*	Ment	State	1,912			1,800	341
			Rated capacity 1,000				
Medford 59 714—Middlesex							
Lawrence Memorial Hosp	Gen	NPAsn	70	34	727	58	2,205
Melrose 23 170—Middlesex							
Melrose Hospital*	Gen	NPAsn	100	22	419	87	2,109
New England Sanitarium and Hospital*	Gen	Church	130	17	304	104	2,409
Middleboro 3 608—Plymouth							
Lakeville State Sanat*	TB	State	202			281	2,57
St Luke's Hospital	Gen	NPAsn	32	8	96	9	279
Middleton 1 712—Essex							
Essex Sanatorium	TB	County	360			309	316
Milford 14 741—Worcester							
Milford Hospital*	Gen	NPAsn	60	10	331	30	1,601
Wilton 16 434—Norfolk							
Milton Hospital and Convalescent Home	Gen	NPAsn	27	12	43	11	444
Montague City 761—Franklin							
Farren Memorial Hospital*	Gen	Church	80	10	104	46	1,219
Nantucket 3 678—Nantucket							
Nantucket Cottage Hosp	Gen	Corp	19	5	63	13	410
Natick 13 089—Middlesex							
Leonard Morse Hospital	Gen	City	61	14	119	36	802
Needham 10 848—Norfolk							
Glover Memorial Hospital	Gen	City	22	10	73	13	476
New Bedford 112 097—Bristol							
St Luke's Hospital*	Gen	NPAsn	294	40	863	180	6,861
Sassaquin Sanatorium	TB	NPAsn	116			110	90
Union Hospital	Gen	Corp	31	3	50	20	715
Newburyport 10 084—Essex							
Anna Jaques Hospital	Gen	NPAsn	52	10	142	34	960
Newburyport Homeopathic Hospital	Gen	NPAsn	20	5	49	10	390
Newton 60 276—Middlesex							
New England Peabody Home for Crippled Children	TbOr	NPAsn	100			82	14
Newton Hospital*	Gen	NPAsn	198	46	635	138	5,186
North Adams 21 621—Berkshire							
North Adams Hospital	Gen	NPAsn	91	19	297	57	1,840
Northampton 24 381—Hampshire							
Cooley Dickinson Hosp*	Gen	State	1,947			1,903	3,446
Northampton State Hosp*	Ment	State	1,947			1,903	668
			Rated capacity 1,688				
Veterans Admin Facility	Ment	Vet	600			600	74
North Grafton 2 340—Worcester							
Grafton State Hospital*	Ment	State	1,442			1,407	103
			Rated capacity 1,208				
North Wilmington 472—Middlesex							
North Reading State Sanatorium*	TbChil	State	297			201	274
Norwood 15 019—Norfolk							
Norwood Hospital	Gen	NPAsn	80	20	42	60	946
Oak Bluffs 1 332—Dukes							
Martha's Vineyard Hospital	Gen	NPAsn	31	10	73	14	407
Palmer 9 377—Hampden							
Monson State Hospital*	Foll	State	1,021			1,010	100
			Rated capacity 1,164				
Wing Memorial Hospital	Gen	NPAsn	30	8	60	12	937
Peabody 21 340—Essex							
Tosiah B Thomas Hosp	Gen	City	60	15	206	40	1,974
Pittsfield 46 677—Berkshire							
Hillcrest Hospital	Gen	NPAsn	42	10	146	34	991
House of Mercy Hosp**	Gen	NPAsn	200	30	391	112	3,978
St Luke's Hospital*	Gen	Church	106	30	424	91	3,926
Plymouth 13 042—Plymouth							
Jordan Hospital	Gen	NPAsn	50	10	166	31	993
Pocasset 36—Barnstable							
Barnstable County Sanat	TbIso	County	48			45	12
Quincy 71 908—Norfolk							
Quincy City Hospital*	Gen	City	240	50	830	181	6,261
Rutland 2 442—Worcester							
Central New England Sanat	TB	NPAsn	7			0	0
Jewish Tuberculosis Sanat	TB	NPAsn	20			17	45
Rutland State Sanatorium*	TB	State	370			377	276
Rutland Heights—Worcester							
Veterans Admin Facility	TB	Vet	471			392	1,130
Salem 43 300—Essex							
North Shore Babies Hosp	Chil	NPAsn	50			0	491
Salem Hospital*	Gen	NPAsn	105	20	314	123	4,941
Sharon 3 301—Norfolk							
Sharon Sanatorium	TB	NPAsn	50			32	26

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Somerville 103 908—Middlesex Central Hospital	Gen	Indiv	30	25	167	36	1 247
Somerville Hospital	Gen	NPAsn	114	24	552	101	3 131
South Braintree—Norfolk							
Norfolk County Hospital	TB	County	150				174
Southbridge, 14 264—Worcester							
Harrison Memorial Hosp	Gen	NPAsn	40	12	144	22	781
South Dartmouth, 1 815—Bristol							
Soie Mar Orthopedic Hospital for Children	Orth	NPAsn	80			56	36
South Hanson 831—Plymouth							
Plymouth County Hospital	TB	County	140			101	101
Springfield 149 900—Hampden							
Health Department Hospital	TbIso	City	96	4	51	342	
Mercy Hospital*	Gen	Church	330	50	230	5 833	
Shriners Hospital for Crippled Children*	Orth	Frnt	60		52	415	
Springfield Hospital*	Gen	NPAsn	261	4	215	6 000	
Wesson Maternity Hospo	Mat	NPAsn	62	66	1 330	45	1,510
Wesson Memorial Hosp*	Gen	NPAsn	120		2	71	2 483
Stockbridge 1 762—Berkshire							
Austen Riggs Foundation	Nerv	NPAsn	52		43	308	
Taunton 37 505—Bristol							
Morton Hospital	Gen	Corp	64	12	306	38	2 396
Taunton State Hospital*	Ment	State	1 070			1,644	698
		Rated capacity	1 245				
Tewksbury 5 580—Middlesex							
State Infirmary*	Gen	State	3,110	40	129	2 851	2 517
Vineyard Haven 1,500—Dukes							
U S Marine Hospital	Gen	USPHS	24			21	134
Waltham 30 247—Middlesex							
Metropolitan State Hospital	Ment	State	1 735			1 663	268
		Rated capacity	1 587				
Middlesex County Sanat +	TB	County	208			322	319
Waltham Hospital*	Gen	NPAsn	163	53	495	93	3 088
Ware 7,380—Hampshire							
Mary Lane Hospital	Gen	NPAsn	35	12	285	28	1 013
Webster 12 092—Worcester							
Webster District Hospital	Gen	NPAsn	24	7	209	33	1 109
Wellesley 11 470—Norfolk							
Channing Sanitarium	N&M	Corp	34			29	47
Wiswall Sanatorium	N&M	Corp	35			21	37
Westboro 6 409—Worcester							
Westboro State Hospital*	Ment	State	1 482			1 520	485
		Rated capacity	1 331				
Westfield 19 775—Hampden							
Noble Hospital	Gen	NPAsn	95	13	230	42	1 495
Westfield State Sanatorium	TB	State	270			181	79
Westwood, 2 097—Norfolk							
Westwood Lodge	N&M	Corp	21			17	48
Weymouth 20,882—Norfolk							
Weymouth Hospital	Gen	NPAsn	70	24	455	60	2 060
Whitinsville 6 690—Worcester							
Whitinsville Hospital	Gen	NPAsn	15	7	129	12	780
Winchendon 6 202—Worcester							
Millers River Hospital	Gen	NPAsn	25	8	65	17	605
Winchester 12 719—Middlesex							
Winchester Hospital	Gen	NPAsn	65	20	263	41	1 963
Winthrop, 16 852—Suffolk							
Station Hospital	Gen	Army	100	6	68	76	1 059
Winthrop Community Hosp	Gen	NPAsn	44	20	555	31	1 155
Woburn—Middlesex							
Charles Choate Memorial Hospital*	Gen	NPAsn	42	19	293	25	1 024
Worcester 19, 311—Worcester							
Belmont Hospital*	TbIso	City	255			133	497
Fairlawn Hospital	Gen	NPAsn	50	15	179	30	1 095
Harvard Private Hospital	Gen	Corp	25	9	21	5	215
Memorial Hospital*	Gen	NPAsn	185	30	648	187	6 351
St Vincent Hospital*	Gen	Church	225	25	641	189	7 076
Worcester City Hospital*	Gen	City	480	60	1 002	345	9 507
Worcester County Sanat	TB	County	130			122	115
Worcester Hahnemann Hospital*	Gen	NPAsn	111	29	535	80	2 316
Worcester State Hospital*	Ment	State	2 334			2 342	800
		Rated capacity	2 407				
Wrentham 3 584—Norfolk							
Pondville Hospital at Norfolk*	Cn	State	147			131	1 450

## Related Institutions

Baldwinsville 2 760—Worcester							
Hospital Cottages for Children	Chil	NPAsn	135			125	42
Belchertown 2 139—Hampshire							
Belchertown State School	McDe	State	1 701			1 286	112
		Rated capacity	1 103				
Boston 751 155—Suffolk							
Audubon Hospital	Gen	Indiv	32	3	25	19	601
Bay State Hospital	Gen	Part	21	6	36	11	416
Boston Home for Incurables	Inc	NPAsn	57			56	13
Deer Island Hospital	Inst	CyCo	30		No data supplied		
Fenway Hospital	Gen	Corp	40	3	No data supplied		
Florence Crittenton Home and Hospital	Mat	NPAsn	21	33	93	8	107
MacLeod Hospital	Gen	Corp	25	3	74	12	498
Massachusetts State Prison Hospital	Inst	State	26			5	230
New England Home for Little Wanderers	Inst	NPAsn	19	6			452
Prendergast Preventorium	TB	NPAsn	115		No data supplied		
Riverbank Hospital	Gen	Indiv	22	7	No data supplied		
Tallitha Cumi Home	Mat	NPAsn	32	17	44	61	
Dr Taylor's Private Hosp	Drug	Indiv	18			6	245
Washingtonian Home	Alcoh	NPAsn	25			60	

## MASSACHUSETTS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Brockton 63 797—Plymouth							
Harris Convalescent Home	Conv	Indiv	14				45
Sunshine Private Hospital	Conv	Indiv	8				40
Brookline 47 490—Norfolk							
Board of Health Hospital	TbIso	City	55			25	97
Cambridge 113 643—Middlesex							
Holy Ghost Hospital for Incurables	Inc	Church	215			206	150
Chicopee 43 630—Hampden							
Health Department Hosp	TB	City	28				
Egypt 340—Plymouth							
Children's Sunlight Hosp	Orth	NPAsn	70				150
Framingham 22 210—Middlesex							
Woodside Cottages	Conv	Corp	21			16	43
Greenfield 15 500—Franklin							
Greenfield Isolation Hosp	TbIso	City	20				111
Haverhill 48,710—Essex							
Haverhill City Infirmary	Inst	City	145			116	115
Haverhill Municipal Hospital	Iso	City	40			11	223
Lowell 100 234—Middlesex							
Lowell Tuberculosis Hosp	TbIso	City	90	2		53	154
Lynn 102 230—Essex							
Lynn Isolation Hospital	Iso	City	75			8	177
Malden, 58 036—Middlesex							
Malden Contagious Hosp	TbIso	City	50				159
Marblehead 8 608—Essex							
Children's Island Sanit	Conv	NPAsn	94			94	107
Methuen 21 069—Essex							
Mary E Barr Sanitarium	Gen	Indiv	25	9	168	12	499
Norfolk 1 429—Norfolk							
Hospital of Norfolk State Prison Colony	Inst	State	75			39	562
Pittsfield 49 677—Berkshire							
Frederic S Coolidge Memorial Home	TB	NPAsn	8			6	7
Pittsfield Anti Tuberculosis Hospital	TB	NPAsn	14			11	9
Quincy 71 938—Norfolk							
Wellington Hospital Home	Conv	Corp	30				47
Rutland 2 442—Worcester							
Rutland Cottage Sanatoria	TB	Indiv	55			13	37
Salem 43 353—Essex							
Health Department Hospital for Contagious Diseases	Iso	City	60			7	107
Shirley, 2 427—Middlesex							
Industrial School for Boys	Inst	State	25			7	437
Somerville 103 908—Middlesex							
Somerville Contagious Disease Hospital	Iso	City	40			11	114
Springfield 149 900—Hampden							
Buscill Nursing Home	Conv	Indiv	25			13	48
City of Springfield Infirmary	Inst	City	125			112	103
Renear Wilson Private Hospital	Gen	Part	9	5	25	3	10
Waltham 39 247—Middlesex							
Teresian Lying In Hospital	Mat	Indiv	10	7	165	5	171
Walter E Fernald State School	McDe	State	1 955			1,697	205
		Rated capacity	1 540				
Waltham Baby Hospital	Chil	NPAsn	22			6	55
Wellesley 11 439—Norfolk							
Convalescent Home of the Children's Hospital	Chil	NPAsn	95				
Simpson Infirmary of Wellesley College	Inst	NPAsn	90				501
West Concord 1 851—Middlesex							
Massachusetts Reformatory Hospital	Inst	State	46			90	816
Whitman 7 591—Plymouth							
Whitman Hospital	Gen	Indiv	12	7	55	5	45
Williamstown 3 600—Berkshire							
Williams College Infirmary	Inst	NPAsn	21			5	25
Wrentham 3 584—Norfolk							
Wrentham State School	McDe	State	1 951			1 012	156
		Rated capacity	1 760				

## Summary for Massachusetts

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	201	51 395	44 617	32 756
Related institutions	52	7 745	6 514	29 506
Totals	253	59 140	51 031	40, 514
Refused registration	16	460		

## MICHIGAN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Adrian 13 064—Tawassee							
Emma L Bixby Hospital	Gen	City	42	10	27	32	1152
Albion 8 324—Calhoun							
James W Sheldon Memorial Hospital	Gen	City	40	10	76	22	69
Alma 6 734—Gratiot							
Carney Wilcox Hospital	Gen	Part	31	5	No data supplied		15
R B Smith Memorial Hospital	Gen	NPAsn	90	5			

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Ann Arbor 26 944—Washtenaw Mercywood Sanitarium	N&M	Church	40		30	348	
St Joseph's Mercy Hosp	Gen	Church	123	20	339	112	3 336
State Psychopathic Hosp	Unit of	University	12				
University Hospital	Gen	State	120	34	301	1 075	21 582
Bad Axe 2 339—Huron							
Hubbard Memorial Hospital	Gen	County	20	6	83	19	660
Battle Creek 43 573—Calhoun							
American Legion Hospital	TB	State	30			200	003
Battle Creek Sanitarium	Gen	NPA's'n	500			336	5 597
Calhoun County Public Hosp	TB	County	70			49	69
Leola 1 Post Montgomery							
Hospital	Gen	Church	140	17	447	96	4 021
Nichols Memorial Hospital	Gen	NPA's'n	71	16	465	57	4 365
Bay City 41 350—Bay							
Bay City General Hospital	Gen	City	73	10	125	23	1 063
Bay City Samaritan Hosp	Gen	NPA's'n	43	4	30	23	1 180
Mercy Hospital	Gen	Church	140	20	288	85	5 314
Benton Harbor 15 434—Berrien							
Mercy Hospital	Gen	NPA's'n	45	12	212	41	1 525
Big Rapids 4 671—Mecosta							
Community Hospital	Gen	City	14	9	48	11	503
Brighton 1 287—Livingston							
Mellus Hospital	Gen	Indiv	14	4	20	11	361
Cadillac 9 570—Wexford							
Mercy Hospital	Gen	Church	50	8	79	33	1 674
Wexford County Hospital	G&TB	County	17			16	21
Calumet 1 557—Houghton							
Calumet and Hecla Hosp	Indus	Corp	21			No data supplied	
Camp Custer—Kalamazoo							
Station Hospital	Gen	Army	84			20	508
Veterans Admin Facility	Ment	Vet	835			842	204
Caro 2 304—Tuscola							
Caro Community Hospital	Gen	City	10	5	37	6	300
Cassopolis 1 448—Cass							
McCutcheon Hospital	Gen	Part	8	4	33	5	200
Charlevoix 2 947—Charlevoix							
Charlevoix Hospital	Gen	City	28	8	80	16	515
Charlotte 5 307—Eaton							
Hayes Green Memorial Hosp	Gen	County	15	5	110	8	630
Clare 1 491—Clare							
Clare County General Hosp	Gen	Indiv	17	3	24	12	433
Coldwater 6 735—Branch							
Wade Memorial Hospital	Gen	Indiv	20	5	56	12	500
Crystal Falls 2 990—Iron							
Crystal Falls General Hosp	Gen	Indiv	14	2	24	3	1 12
Dearborn 50 308—Wayne							
St Joseph's Retreat	N&M	Church	300			315	636
Detroit 1 568 922—Wayne							
Alexander Blain Hospital	Gen	NPA's'n	60	5	34	41	1 992
Bethesda Hospital (col)	TB		83			83	93
Charles Godwin Jennings							
Hospital	Gen	NPA's'n	66	9	131	34	1 091
Chenik Hospital	TB	NPA's'n	52			40	104
Children's Hospital	Chil	NPA's'n	239			202	6 999
City of Detroit Receiving							
Hospital	Gen	City	600	20		683	21 360
City of Detroit Receiving							
Hospital (Redford Branch)	Gen	City	50		2	35	1 700
Cottage Hospital	Gen	NPA's'n	40	13	390	26	1 880
Delray General Hospital	Gen	NPA's'n	80	10	400	60	1 979
Detroit Tuberculosis Sanat	TB	NPA's'n	190			137	170
East Side General Hospital	Gen	NPA's'n	80	35	1 014	87	2 936
Edith K Thomas Memorial							
Hospital (col)	Gen	NPA's'n	45	6		Estab	1937
Evangelical Deaconess Hos							
pital	Gen	Church	170	30	676	82	4 290
Fairview Sanatorium (col)	TB	NPA's'n	66			64	87
Florence Crittenton Hosp	Gen	NPA's'n	140	130	1 711	83	3 332
Good Samaritan Hospital							
(col)	TB	Indiv	29			20	64
Grace Hospital	Gen	NPA's'n	408	70	1 827	474	1 445
Crossed Pointe Hospital	Gen	Indiv	30	14	14	23	000
Harper Hospital	Gen	NPA's'n	620	80	1 381	420	18 800
Henry Ford Hospital	Gen	NPA's'n	572	36	727	508	10 040
Herman Kiefer Hosp	Contag	Ob City	1330	65	1 617	1 199	10 477
Ipswich Hospital	Gen	Corp	90	10	103	30	610
Marr General Hospital	Gen	NPA's'n	34	8	180	12	004
Michigan Mutual Hospital	Indus	NPA's'n	30			21	801
Miriam Memorial Hospital	Unit of	Grace Hospital					
Parkside Hospital (col)	Gen	NPA's'n	52	12	177	40	1 468
Pingree General Hospital	Gen	Corp	22	11	188	11	730
Providence Hospital	Gen	Church	309	100	2 566	303	12 961
St Aubin General Hospital							
(col)	Gen	Corp	40		27	29	584
St Joseph's Mercy Hospi							
tals	Gen	Church	200	42	1 062	150	5 498
St Mary's Hospital	Gen	Church	319	40	967	227	7 384
Saratoga General Hospital	Gen	NPA's'n	38	10	100	21	960
Shurly Hospital	Gen	Indiv	70	1	2	61	1 838
Station Hospital	Gen	Army	56			51	743
Trinity Hospital (col)	Gen	NPA's'n	40			43	696
U S Marine Hospital	Gen	USPHS	291			231	2 099
Warren Avenue Diagnostic							
Hospital	Gen	Indiv	18	3	24	11	001
West Side Sanitarium	Gen	Indiv	30			22	190
Woman's Hospital	Gen	NPA's'n	220	100	2 002	169	7 034
Dowagiac 5 000—Cass							
Leo Memorial Hospital	Gen	Church	30	4	71	12	400
Durand 3 081—Shiawassee							
Durand Hospital	Gen	NPA's'n	13	4	47	6	310
Eaton Rapids 2 822—Eaton							
Harriet Chapman Memorial							
Hospital	Gen	Indiv	12	3	46	4	203

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Eloise 710—Wayne							
Eloise Hospital for Mental	Ment	County	3 683			3 046	683
Diseases							
Eloise Hospital—Dr William							
J Seymour Hospital	Gen	County	1 400			1 420	7 402
Escanaba 14 524—Delta							
St Francis Hospital	Gen	Church	75	20	470	57	2 535
Flint 156 492—Genesee							
Hurley Hospital	Gen	City	417	50	1 475	339	10 300
St Joseph's Hospital	Gen	Church	80	30	507	70	3 069
Women's Hospital	Gen	NPA's'n	42	25	741	30	1 223
Fremont 2 157—Newaygo							
Gerber Memorial Hospital	Gen	City	18	5	64	10	464
Gaylord 1 627—Otsego							
Northern Michigan Tubercu							
losis Sanatorium	TB	State	100			Estab	1907
Goodrich 324—Genesee							
Goodrich General Hospital	Gen	NPA's'n	24	4	80	17	1 016
Grand Haven 8 345—Ottawa							
Elizabeth Hatton Memorial							
Hospital	Gen	City	20	6	122	12	499
Grand Rapids 168 592—Kent							
Blodgett Memorial Hosp	Gen	NPA's'n	137	18	495	89	3 410
Butterworth Hospital	Gen	NPA's'n	224	48	830	201	5 867
Christian Psychopathic Hos							
pital	N&M	City	260			242	234
City General Hospital	Gen	NPA's'n	30			16	304
Ferguson Droste Ferguson							
Sanitarium	Proct	Corp	33			21	886
St Mary's Hospital	Gen	Church	218	30	659	140	7 077
Sunshine Sanatorium	TB	City	145			100	143
Grayling 1 973—Crawford							
Grayling Mercy Hospital	Gen	Church	50	5	58	20	948
Greenville 4 730—Montcalm							
United Memorial Hospital	Gen	NPA's'n	19	6	46	10	487
Hamtramck 56 268—Wayne							
St Francis Hospital	Gen	Church	50	12	273	43	1 918
Hancock 5 795—Houghton							
St Joseph's Hospital	Gen	Church	65	12	120	52	1 205
Hart 1 690—Oceana							
Oceana Hospital	Gen	NPA's'n	17	4	81	16	728
Hastings 5 227—Barry							
Pennock Hospital	Gen	NPA's'n	27	8	150	13	671
Highland Park 52 900—Wayne							
Highland Park General Hos							
pital	Gen	City	156	34	1 009	133	4 670
Hillsdale 5 896—Hillsdale							
Hillsdale Hospital	Gen	City	25	6	128	20	1 164
Holland 14 340—Ottawa							
Holland City Hospital	Gen	City	40	10	170	22	1 278
Houghton 3 787—Houghton							
Copper Country Sanatorium	TB	County	53			53	33
Howell 3 615—Livingston							
McPherson Memorial Hosp	Gen	City	20	7	74	13	518
Michigan State Sanatorium	TB	State	450			471	280
Ionia 6 000—Ionia							
Ionia State Hospital	Ment	State	917			906	132
Rated capacity			831				
Iron Mountain 11 600—Dickinson							
Iron Mountain Gen Hosp	Gen	City	23	8	129	19	844
Ironwood 14 299—Gogebic							
Grand View Hospital	C&TB	County	52	8	48	39	1 300
Newport Hospital	Gen	NPA's'n	12	4	104	8	000
Twin City Hospital	Gen	Indiv	21	3	No data supplied		
Ishpeming 9 238—Marquette							
Ishpeming Hospital	Gen	Corp	40	10	207	40	1 146
Jackson 50 187—Jackson							
W A Foote Memorial Hos							
pital	Gen	City	150	22	577	102	4 138
Jackson County Sanat	TB	County	64			66	17
Mercy Hospital	Gen	Church	110	20	418	72	3 181
Kalamazoo 54 786—Kalamazoo							
Borress Hospital	Gen	Church	214	20	610	123	3 810
Bronson Methodist Hosp	Gen	Church	108	27	509	72	3 060
Fairmount Hospital	TB	County	141			80	408
Kalamazoo State Hospital	Ment	State	2 760			2 708	372
Rated capacity			2 297				
Lake Linden 1 714—Houghton							
Lake Superior General Hosp	Gen	NPA's'n	9	2	13	5	223
Lakerview 800—Montcalm							
Kelsey Hospital	Gen	Indiv	18	4	27	6	200
Lansing 78 394—Ingham							
Edward W Sparrow Hosp	Gen	NPA's'n	130	20	766	100	4 006
Ingham Sanatorium	TB	County	100			74	188
St Lawrence Hospital	Gen	Church	100	20	582	104	6 490
Laurium 4 916—Houghton							
Calumet Memorial Hospital	Gen	NPA's'n	20	6	103	18	940
Ludington 8 893—Mason							
Paulina Stearns Hospital	Gen	NPA's'n	22	3	81	17	674
Manistee 8 078—Manistee							
Mary's Hosp and Sanit	Gen	Church	00	6	57	17	604
Manistique 5 198—Schoolcraft							
Shaw General Hospital	Gen	Indiv	20	4	31	10	000
Marquette 14 789—Marquette							
Morgan Heights Sanat	TB	County	90			79	000
St Luke's Hospital	Gen	NPA's'n	90	10	121	89	2 000
St Mary's Hospital	Gen	Church	60	9	170	40	1 077
Marshall 5 019—Calhoun							
Oak Lawn Hospital	Gen	NPA's'n	17	7	75	11	400
Menominee 10 320—Menominee							
St Joseph's Hospital	Gen	Church	55	13	206	20	2 166
Monroe 15 110—Monroe							
Mercy Hospital	Gen	Church	53	15	227	29	1 410
Monroe Hospital	Gen	NPA's'n	53	8	163	56	2 450

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Morenci 1773—Lenawee	Gen	Part	14	3	41	9	445
Blanchard Hospital	Gen	Part	14	3	41	9	445
Mt Clemens, 13 497—Macomb	Gen	Church	12	15	27	70	2 149
St Joseph Sanitarium and Hospital	Gen	Army	57	1	13	32	670
Station Hospital	Gen	Part	2	5	57	21	1,082
Mt Pleasant 5211—Isabella	Gen	NPAsen	23	5	101	15	730
McArthur Strange Hospital	Gen	NPAsen	22	3	73	14	803
Mt Pleasant Community Hospital	Gen	NPAsen	108	17	36	68	2 76
Munising, 3956—Alger	Gen	Church	100	2	707	71	4 79
Munising Hospital	Gen	County	70			6	62
Muskegon 41 300—Muskegon	Gen	NPAsen	108	17	36	68	2 76
Hackley Hospital	Gen	Church	100	2	707	71	4 79
Mersey Hospital	Gen	County	70			6	62
Muskegon County Sanat	TB	County	70			6	62
Newberry 2 465—Luce	Ment	State	1 325			1,300	329
Newberry State Hospital	Gen	Rated capacity 1 031	14	6	77	7	330
Perry Spinks Hospital	Gen	Part	14	6	77	7	330
Miles, 11,320—Berrien	Gen	NPAsen	3	9	142	16	900
Pawating Hospital	Gen	NPAsen	3	9	142	16	900
Northville 2 66—Wayne	TB	Corp	9			92	97
Last Lawn Sanatorium	Gen	Indiv	21	4	33	6	2 022
Sessions Private Hospital	Gen	City	84			802	712
Wm H Maybury Sanat	TB	City	84			802	712
Norway, 4 016—Dickinson	Gen	Corp	14	5	68	7	310
Penn Iron Mining Co Hosp	Gen	Corp	14	5	68	7	310
Ontonagon 1 937—Ontonagon	Gen	Indiv	1	5	39	13	328
Ontonagon Hospital	Gen	Indiv	1	5	39	13	328
Oshkemo 1,620—Kalamazoo	TB	Corp	125			110	109
Pine Crest Sanatorium	TB	Corp	125			110	109
Owosso 14 406—Shiawassee	Gen	NPAsen	90	10	3,68	5	2 124
Memorial Hospital	Gen	NPAsen	90	10	3,68	5	2 124
Petoskey, 3,740—Emmet	Gen	City	32	6	143	31	1 110
Lockwood Hospital	Gen	NPAsen	41	6	138	3	1 262
Petoskey Hospital	Gen	NPAsen	41	6	138	3	1 262
Plafnell 2 270—Allegan	Gen	City	20	6	127	12	303
Wm Crispo Hospital	Gen	City	20	6	127	12	303
Pontiac, 64,928—Oakland	Gen	County	8			50	1 080
Oakland County Contagious Hospital	Gen	County	8			50	1 080
Oakland County Tuberculo	TB	County	190			187	240
sis Sanatorium	TB	County	112	20	40	70	3,413
Pontiac General Hospital	Gen	City	182			1 810	364
Pontiac State Hospital	Ment	State	1 82			1 810	364
St Joseph Mercy Hosp *	Gen	Church	160	25	6,7	107	3 896
Pt Huron 31 361—St Clair	Gen	NPAsen	120	15	187	67	2,378
Pt Huron Hospital	Gen	NPAsen	120	15	187	67	2,378
Powers, 360—Menominee	TB	County	100			97	121
Pinecrest Sanatorium	TB	County	100			97	121
Red City 1,792—Oscoda	Gen	City	13	3	36	12	437
Reed City Hospital	Gen	City	13	3	36	12	437
River Rouge 17 314—Wayne	Gen	Indiv	2	4		Estab	1937
Sidney A Sumby Memorial Hospital	Gen	Indiv	2	4		Estab	1937
Royal Oak, 22 904—Oakland	Gen	Indiv	19	4	32	14	511
Royal Oak Private Hosp	Gen	Indiv	19	4	32	14	511
Saginaw 80,170—Saginaw	Gen	City	28	5	No data supplied		
Saginaw City Hospital	Gen	City	17			93	342
Saginaw County Hospital	Thiso	County	129	23	4,8	102	2 366
Saginaw General Hospital	Gen	NPAsen	50	12	397	41	1 712
St Luke's Hospital	Gen	Church	100	20	334	122	4 033
St Mary's Hospital	Gen	Church	100	20	334	122	4 033
St Johns, 3 929—Clinton	Gen	NPAsen	43	10	142	23	1 223
Clinton Memorial Hospital	Gen	NPAsen	43	10	142	23	1 223
St Joseph 8 349—Berrien	Gen	NPAsen	32	8	104	18	787
St Joseph Sanitarium	Gen	NPAsen	32	8	104	18	787
Sault Ste Marie 10 755—Chippewa	Gen	County	62	2	274	1	1 911
Chippewa County War Me	Gen	County	62	2	274	1	1 911
morial Hospital	Gen	Army	66	1	33	491	
Station Hospital	Gen	Army	66	1	33	491	
South Haven, 4 804—Van Buren	Gen	Indiv	12	6	11	5	171
Panoyar Memorial Hospital	Gen	Indiv	12	6	11	5	171
Stambaugh 2 400—Iron	Gen	NPAsen	27	6	90	14	661
General Hospital Company	Gen	NPAsen	27	6	90	14	661
of Iron River District	Gen	NPAsen	27	6	90	14	661
Sturgis 6 900—St Joseph	Gen	City	38	6	190	20	859
Sturgis Memorial Hospital	Gen	City	38	6	190	20	859
Three Rivers, 6 863—St Joseph	Gen	City	30	7	12	16	780
Three Rivers Hospital	Gen	City	30	7	12	16	780
Traverse City, 12 339—Grand Traverse	Gen	State	22			13	333
Central Michigan Children's	Chil	State	22			13	333
Clinic	Chil	State	22			13	333
James Decker Munson Hos	Gen	State	80	11	212	40	1 117
pitalo	Gen	State	80	11	212	40	1 117
Traverse City State Hosp *	Ment	State	2 340			2 342	342
Traverse City State Hosp *	Gen	Rated capacity 1 910	20	5	33	8	226
Trinmountain 2 341—Houghton	Gen	NPAsen	20	5	33	8	226
Copper Range Hospital	Gen	NPAsen	20	5	33	8	226
West Branch 1 164—Ogemaw	Gen	City	17	4	46	9	340
Tollfree Memorial Hospital	Gen	City	17	4	46	9	340
Wyandotte 2 368—Wayne	Gen	City	100	30	642	121	3 81
Wyandotte General Hosp	Gen	City	100	30	642	121	3 81
Ypanti 10 143—Washtenaw	Gen	City	30	6	146	10	808
Beyer Memorial Hospital	Gen	City	30	6	146	10	808
Hall Memorial City Hosp	Gen	City	30	6	146	10	808
Leland Sanatorium	TB	NPAsen	135			81	7
Ypanti State Hospital	Ment	State	1 614			1 612	403
Ypanti State Hospital	Gen	Rated capacity 1 317	14	3	0	5	2 6
Zeeland 2 840—Ottawa	Gen	NPAsen	14	3	0	5	2 6
Thomas G Huizinga Memo	Gen	NPAsen	14	3	0	5	2 6
rial Ho pital	Gen	NPAsen	14	3	0	5	2 6

## MICHIGAN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Addison 4.2—Lenawee							
Addison Community Hosp	Gen	County	5	2	21	2	17
Adrian 13 064—Lenawee							
Lenawee County Tuberculo							
sis Sanatorium	TB	County	2			22	13
Alma 6 734—Gratiot							
Michigan Masonic Home	Inst	Frat	4			2	103
and Hospital							
Ann Arbor 26 944—Washtenaw							
Cowles Hospital	Gen	Indiv	9			2	12
Coldwater 6 755—Branch							
Michigan Children's Village	MeDe	State	24			2.0	0
Rated capacity 250							
Crystal Falls 2 993—Iron							
Iron County Infirmary	Gen	County	18			8	0
Detroit 1 368,662—Wayne							
De Nike Sanitarium	Alcoh	Indiv	18			12	100
Doctors Hospital	Conv	Indiv	3			0	0
Memorial Hospital	SA Ca	Part	6			1	10
Mersey Hospital (col)	Gen	Indiv	46	6	41	2	300
St Luke's Convalescent							
Home	Conv	Church	26			0	146
William Booth Memorial							
Hospital	Mat	Church	83	10	367	36	44
Douglas 368—Allegan							
Community Hospital	Gen	Indiv	11	3	32	6	23
Edmore 897—Montcalm							
Edmore Hospital	Gen	Indiv	10	2	37	4	0
Farmington 1 243—Oakland							
Children's Hospital Conva	Conv	NPAsen	240			145	33
lescent Home							
Ferdale 20 535—Oakland							
Edmore Hospital	Gen	Indiv	12	8	161	9	413
Flint 1 66 492—Genesee							
Genesee County Infirmary	Inst	Gen	220			63	200
Grand Rapids 168 592—Kent							
Kent County Receiving Hosp	Ment	County	32			1	43
Michigan Soldiers' Home							
Hospital	Inst	State	245			10	201
Municipal Isolation Hosp	Isolation	City	22				
Salvation Army Evangeline							
Booth Home and Hospital	Mat	Church	80	6	102	36	179
Harbor Beach 1 892—Huron							
Harbor Beach Hospital	Gen	Corp	1	4	23	8	331
Hazel Park—Oakland							
Helene Melnik Hospital	Gen	Indiv	12	8	48	5	283
Ionia 6 562—Ionia							
Michigan State Reforma							
tory	Inst	State	22			12	84
Jackson 5 187—Jackson							
Florence Crittenton Home							
and Hospital	Mat	NPAsen	2	12	3	1	37
Jackson County Isolation							
Hospital	Isolation	County	70			12	67
Michigan State Prison Hosp	Inst	State	22			10	98
Lansing 78 397—Ingham							
Boys Vocational School							
Hospital	Inst	State	22			10	40
Lansing City Hospital	Isolation	City	3			1	40
Lapeer 6008—Lapeer							
Lapeer City Hospital	Gen	Part	18	4	28	6	3
Michigan Home and Train							
ing School	MeDe	State	722			3 061	0
Rated capacity 2 790							
Marquette 14 769—Marquette							
Hospital of the State House							
of Correction and Branch							
Prison	Inst	State	24			4	171
Mt Clemens 13 497—Macomb							
Sigma Gamma Hospital							
School for Crippled Chil	Orth	NPAsen	30			39	152
dren							
Negaunee 6 552—Marquette							
Twin City Hospital	Gen	Indiv	20	3	No data supplied		
Northville 2 66—Wayne							
Wayne County Training							
School	MeDe	County	83			662	152
Otter Lake 3 6—Lapeer							
American Legion Children's	TB	Frat	12			12	2
Billet							
Plymouth 4 44—Wayne							
Plymouth Hospital	Gen	Part	10	3	2	6	3
Pontiac 64 928—Oakland							
Oakland County Infirmary	Inst	County	2			100	576
Pt Huron 31 361—St Clair							
Pt Huron Emergency Hosp	Isolation	City	22			4	70
Rochester 3 54—Oakland							
Haven Sanitarium	Gen	Indiv	40			3	151
Rockland 700—Ontonagon							
Ontonagon County Sanat	TB	County	70			16	1
Rogers City 3 278—Presque Isle							
Rogers City Hospital	Gen	Indiv	6	1		2	50
Romeo 2 24—Macomb							
Wheeler Convalescent Home	TB	Indiv	40			23	83
Royal Oak 22 84—Oakland							
Sunnybrook Hospital	Gen	Indiv	27	7	64	6	27
St Clair 3 2,9—St Clair							
St Clair Community Hosp	Gen	City	12	5	66	10	64
Stockbridge 71—Ingham							
Ross Memorial Hospital	Gen	Part	8	3	32	5	1
Traverse City 12 59—Grand Traverse							
Grand Traverse County							
Gratiot	Gen	County	2	2	14	14	20

## MICHIGAN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Wahjamega 111—Tuscola Michigan State Hospital for Epileptics	Epi	State	1 008			990	131
		Rated capacity	699				
Summary for Michigan					Average Census		Admissions
Hospitals and sanatoriums			Number	Beds	31 724	372 982	
Related institutions			48	36 100	6 640	10 942	
Totals			211	43 915	38 363	388 924	
Refused registration			24	606			

## MINNESOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Ada 1285—Norman Norman County Memorial Hospital	Gen	NPA'ssn	11	3	30	3	170
Adrian 1000—Nobles Adrian Hospital	Gen	Indiv	14	3	61	4	187
Ah gwa ching 40—Cass Minnesota State Sanat	TB	State	480			368	502
Albert Lea 10 169—Freeborn Naevs Hospital	Gen	NPA'ssn	70	11	394	54	209
Alexandria 3 876—Douglas Douglas County Hospital	Gen	NPA'ssn	30	6	35	12	381
St Luke's Hospital	Gen	Indiv	17	6	38	9	310
Appleton 1 620—Swift Kaufman Hospital	Gen	Indiv	18	4	20	6	377
Austin 12 276—Mower St Olaf Lutheran Hospital	Gen	Church	57	12	260	33	1 047
Bagley 880—Clearwater Clearwater Hospital	Gen	Indiv	12	4	No data supplied		
Battle Lake 552—Otter Tail Otter Tail County Sanat	TB	County	42			24	24
Bemidji 7 202—Beltrami Lutheran Hospital	Gen	NPA'ssn	42	8	173	26	1 196
Benson 2 090—Swift Swift County Hospital	Gen	NPA'ssn	19	5	53	10	519
Blwabik 1 388—St Louis Blwabik Hospital	Gen	Indiv	12	3	30	3	170
Blue Earth 2 884—Faribault Blue Earth Hospital	Gen	Indiv	10	4	39	5	200
Brainerd 10 221—Crow Wing St Joseph's Hospital	Gen	Church	70	10	195	44	1 630
Brckenridge 2 964—Wilkin St Francis Hospital	Gen	Church	50	12	213	44	1 171
Buffalo 1 469—Wright Cattlin Hospital	Gen	Part	12	3	27	4	130
Canby 1 738—Yellow Medicine John Swenson Memorial Hospital	Gen	City	18	5	52	8	300
Cannon Falls 1 308—Goodhue Mineral Springs Sanat	TB	County	100			90	60
Cass Lake 1 400—Cass Consolidated Chippewa In dian Hospital	Gen	IA	32	4		Estab	1937
Clarkfield 802—Yellow Medicine Clarkfield Community Hosp	Gen	Corp	10	4	54	6	208
Cloquet 6 782—Carlton Eppard Hospital	Gen	Indiv	7	4	29	2	72
Fond du Lac Indian Hosp	Gen	IA	22	4	67	21	473
Rafter Hospital	Gen	Part	36	6	103	13	660
Crookston 6 321—Polk Bethesda Hospital	Gen	Church	40	10	134	29	1 043
St Vincent's Hospital	Gen	Church	44	6	113	33	927
Sunnyrest Sanatorium	TB	County	12			68	66
Crosby 3 401—Crow Wing Miner's Hospital	Gen	Indiv	20	6	38	6	240
Dawson 1 386—Lac qui Parle Dawson Surgical Hospital	Gen	Corp	20	4	32	12	476
Deerwood 502—Crow Wing Deerwood Sanatorium	TB	County	26			19	23
Detroit Lakes 3 605—Becker Community Hospital	Gen	NPA'ssn	21	6	99	15	578
Duluth 101 463—St Louis Miller Memorial Hospital	Gen	City	30	8		19	322
St Luke's Hospital	Gen	NPA'ssn	247	33	760	174	6 089
St Mary's Hospital	Gen	Church	260	30	694	200	5 343
Webber Hospital	Gen	Corp	40	10	200	24	1 311
Elv 6 106—St Louis Shipman Hospital	Gen	Part	10	6	30	4	204
Eveleth 7 484—St Louis More Hospital	Gen	Corp	30	8	80	17	696
Fairmont 5 521—Martin Fairmont Clinic and Hosp	Gen	Corp	36	12	61	13	609
Candler Hospital	Gen	Indiv	10	4	15	3	212
Hunt Hospital	Gen	Part	12	6	18	4	209
Faribault 12 767—Rice St Lucas Evangelical Dea coness Hospital	Gen	Church	50	14	227	42	1 302
Fergus Falls 9 389—Otter Tail Fergus Falls State Hosp	Gen	State	200			2 026	712
		Rated capacity	1 000				
George B Wright Memorial Hospital	Gen	NPA'ssn	38	9	116	23	913
St Luke's Hospital	Gen	NPA'ssn	30	8	120	20	700
Ft Snelling 1 027—Hennepin Station Hospital	Gen	Army	168	7	87	148	2 266

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census
Fosston 978—Polk Fosston Hospital	Gen	Part	12	4	70	9
Graceville 969—Big Stone West Central Minnesota Hospital	Gen	NPA'ssn	20	5	119	16
Grand Rapids 3 206—Itasca Itasca Hospital	Gen	County	40	15	122	38
Granite Falls 1 791—Yellow Medicine Granite Falls Hospital	Gen	Indiv	11	5	30	6
Riverside Sanatorium	TB	County	50			46
Hallack 869—Kittson Kittson War Veterans Me morial Hospital	Gen	County	33	10	98	26
Hendricks 702—Lincoln Hendricks Hospital	Gen	NPA'ssn	14	4	36	9
Heron Lake 786—Jackson Southwestern Minnesota Hospital	Gen	Indiv	12	2	28	5
Hibbing 15 666—St Louis Adams Hospital	Gen	Indiv	20	6	67	12
Rood Hospital	Gen	Indiv	40	10	106	21
Hutchinson 3 406—McLeod Hutchinson Community Hospital	Gen	NPA'ssn	20	7	57	14
International Falls 5 036—Koochiching Craig Hospital	Gen	Indiv	27	6	54	20
Northern Minnesota Hosp	Gen	Corp	30	6	No data supplied	
Jackson 2 266—Jackson Halloran Hospital	Gen	Part	10	4	60	6
Lake City 3 210—Wabasha Lake City Hospital	Gen	NPA'ssn	19	5	61	14
Lake Park 624—Becker Sand Beach Sanatorium	TB	County	46			43
Litchfield 2 880—Meeker Litchfield Hospital	Gen	Corp	27	6	94	20
Little Falls 5 014—Morrison St Gabriel's Hospital	Gen	Church	40	9	133	23
Luverne 2 614—Rock Luverne Hospital	Gen	Part	15	6	99	6
Madison 1 916—Lac qui Parle Ebenezer Lutheran Hosp	Gen	Church	20	7	61	10
Mankato 14 038—Blue Earth Immanuel Hospital	Gen	Church	60	15	220	37
St Joseph's Hospital	Gen	Church	108	18	312	48
Marshall 3 200—Lyon Marshall Hospital	Gen	Corp	20	5	22	9
McLeod 1 801—Stearns McLeod Hospital	Gen	Indiv	10	3	20	3
Minneapolis 464 306—Hennepin Abbott Hospital	Gen	Church	100	18	375	80
Asbury Hospital	Gen	Church	122	18	410	83
Ellet Hospital	Gen	NPA'ssn	100	20	424	106
Elliot Memorial Hospital	Unit of University Hospitals					
Fairview Hospital	G&TB Church		200	25	522	94
Harriet Walker Hospital	Unit of University Hospitals					
Lutheran Deaconess Home and Hospital	Gen	Church	120	30	518	113
Maternity Hospital	MatCh	NPA'ssn	83	34	789	76
Minneapolis General Hos pital	Gen	City	616	65	1 941	400
Minnesota General Hospital	See University Hospitals					
Northwestern Hospital	Gen	NPA'ssn	165	20	502	167
Ripley Memorial Hospital	Unit of Maternity Hospital					
St Andrew's Hospital	Gen	Church	80	20	337	57
St Barnabas Hospital	Gen	NPA'ssn	149	28	564	86
St Mary's Hospital	Gen	Church	220	30	623	150
Shriners Hospital for Crip pled Children	Orth	Frat	60			60
Swedish Hospital	Gen	NPA'ssn	225	42	868	179
Todd Memorial Eye Ear Nose and Throat Hospital	Unit of University Hospitals					
University Hospitals	Gen	State	40	20	465	341
Veterans Admin Facility	G&TB Vet		642			537
William Henry Eustis Chil dren's Hospital	Unit of University Hospitals					
Montevideo 4 319—Chippewa Montevideo Hospital	Gen	NPA'ssn	40	10	202	29
Moorhead 7 651—Clay St Ansgars Hospital	Gen	Church	30	10	147	30
Moose Lake 742—Carlton Moose Lake Community Hospital	Gen	Indiv	10	3	42	4
Morris 2 474—Stevens Morris Hospital	Gen	Indiv	15	5	38	8
Mountain Lake 1 388—Cottonwood Bethel Hospital	Gen	Church	20	5	100	8
Clinic Hospital	Gen	Indiv	20	5	100	10
New Prague 1 443—Le Sueur New Prague Community Hospital	Gen	NPA'ssn	20	3		New building
New Ulm 7 508—Brown Loretto Hospital	Gen	Church	40	8	139	33
Union Hospital	Gen	NPA'ssn	30	9	143	39
Nopemine 384—St Louis Nopemine Sanatorium	TB	County	230			230
Northfield 4 103—Rice Northfield City Hospital	Gen	City	12	4	30	6
Oak Terrace 50—Hennepin Glen Lake Sanatorium	TB	County	602	6	6	670
Ortonville 2 017—Big Stone Ortonville Evangelical Hos pital	Gen	Church	20	4	60	7
Owatonna 7 654—Steele Owatonna City Hospital	Gen	City	46	9	130	30
Paynesville 1 121—Stearns Paynesville Hospital	Gen	Indiv	15	3		

Key to symbols and abbreviations is on page 986

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Perham 1411—Otter Tail	Gen	Church	36	5	111	20	663
St James Hospital	Gen	Indiv	32	5	64	20	361
Pine River 422—Cass	Gen	CyCo	46	8	90	14	579
Holman Hospital	Gen	Indiv	44			17	37
Pipestone 3489—Pipestone	TB	Indiv	30	4	49	9	362
Ashton Memorial Hospital	Gen	Indiv					
Pokegama, 20—Pine	Gen	Indiv					
Pokegama Sanatorium	Gen	Indiv					
Princeton, 1636—Mille Laes	Gen	Indiv					
Northwestern Hospital	Gen	Indiv					
Pupowsky 63—Beltrami	Gen	Indiv					
Lake Julia Tuberculosis Sanatorium	TB	County	57			52	63
Redlake 214—Beltrami	Gen	IA	23	6	78	16	836
Red Lake Indian Hosp	Gen	IA					
Red Wing 9629—Goodhue	Gen	City	40	6	83	27	864
Red Wing Hospital	Gen	City	70	10	239	40	1,630
St John's Hospital	Gen	City					
Redwood Falls, 202—Redwood	Gen	Part	10	4	59	6	727
Redwood Falls Hospital	Gen	Part					
Richmond 603—Stearns	Gen	NPAssn	10		29	5	280
Richmond Hospital	Gen	NPAssn					
Rochester 20621—Olmsted	Gen	Corp	269			2,670	7,012
Colonial Hospital	Gen	Corp	125			19	1,307
Kahler Hospital	Gen	Corp	125			19	1,307
Rochester State Hospital	Ment	State	1,494			1,433	547
St Mary's Hospital	Gen	Church	542	28	540	431	11,963
Worral Hospital	SA, Ca, ENT	Corp	190			131	8,209
Roseau 1028—Roseau	Gen	Indiv	10	3	17	8	298
Budd Hospital	Gen	Indiv					
St Cloud 21000—Stearns	Gen	Church	202	21	474	131	3,207
St Cloud Hospital	Gen	Church	702			767	200
Veterans Admin Facility	Ment	Vet					
St Paul 21006—Ramsey	Gen	CyCo	800	50	1,075	594	9,781
Ancker Hospital	Gen	CyCo	120	20	808	111	4,721
Bethesda Hospital	Gen	CyCo	220	20	688	161	6,103
Charles T. Miller Hosp	Gen	NPAssn	60			29	1,377
Children's Hospital	Chil	NPAssn					
Gillette State Hospital for Crippled Children	Ortho	State	200			208	764
Midway Hospital	Gen	Church	100	20	581	77	2,701
Mounds Park Hospital	Gen	Church	110	12	216	98	1,724
Northern Pacific Beneficial Association Hospital	Gen	NPAssn	130	11	111	50	2,406
Ramsey County Tuberculosis Pavilion	Unit of Ancker Hospital						
St John's Hospital	Gen	Church	75	15	209	47	1,757
St Joseph's Hospital	Gen	Church	200	32	683	197	7,801
St Luke's Hospital	Gen	NPAssn	120	20	206	64	2,961
St Luke's Hospital	Gen	Church	51	16	285	32	1,542
West Side General Hosp	Gen	Church					
St Peter 4811—Nicollet	Gen	Corp	70	10	52	8	298
Covell Hospital	Ment	State	2,241			2,240	739
St Peter State Hospital	Ment	State					
Slayton, 1102—Murray	Gen	Part	20	8	No data supplied		
Home Hospital	Gen	Part					
Springfield 2049—Brown	Gen	Church	16	5	60	11	301
St John's Hospital	Gen	Church					
Spring Grove 867—Houston	Gen	Corp	14	7	80	8	207
Spring Grove Hospital	Gen	Corp					
Staples 2067—Todd	Gen	City	21	5		Estab	1937
Municipal Hospital	Gen	City					
Starbuck 781—Pope	Gen	NPAssn	15	5	67	8	217
Minnekahta Hospital	Gen	NPAssn					
Stillwater 7173—Washington	Gen	CyCo	30	6	147	24	700
Lakeview Memorial Hosp	Gen	CyCo					
Thief River Falls 4268—Pennington	TB	County	55			54	37
Oakland Park Sanatorium	Gen	NPAssn	23	6	133	13	746
Physicians Hospital	Gen	NPAssn	41	6	61	22	872
St Luke's Hospital	Gen	NPAssn					
Tracey 2570—Lyon	Gen	Part	12	6	40	6	200
Clinic Hospital	Gen	Indiv	17	4	80	9	500
Tracy Hospital	Gen	Indiv					
Two Harbors 4420—Lake	Gen	Part	35	6	70	19	676
Two Harbors Hospital	Gen	Part					
Tyler, 900—Lincoln	Gen	NPAssn	18	5	90	12	511
Tyler Hospital	Gen	NPAssn					
Virginia 11963—St Louis	Gen	City	46	10	166	31	940
Virginia Municipal Hosp	Gen	City					
Wabasha 2212—Wabasha	TB	County	30			24	15
Buena Vista Sanatorium	Gen	Church	42	6	57	25	578
St Elizabeth's Hospital	Gen	Church					
Wadena 2512—Wadena	TB	County	36			70	62
Fair Oaks Lodge Sanat	Gen	Church	42	6	121	25	760
Wesley Hospital	Gen	Church					
Walker 618—Cass	Gen	Indiv	20	2	26	4	166
Walker Hospital	Gen	Indiv					
Warren 1472—Marshall	Gen	Church	30	6	67	14	470
Warren Hospital	Gen	Church					
Warroad 1184—Roseau	Gen	City	16	4	55	10	317
Warroad Hospital	Gen	City					
Waseca 3815—Waseca	Gen	CyCo	26	8	157	13	579
Waseca Memorial Hospital	Gen	CyCo					
White Earth 410—Becker	Gen	IA	20	6	136	17	300
White Earth Indian Hosp	Gen	IA					
Willmar 6173—Kandiyohi	Gen	Corp	35	5	60	13	401
Willmar Hospital	Gen	Corp					
Windom 2123—Cottonwood	Gen	NPAssn	15	5	50	6	314
Windom Hospital	Gen	NPAssn					
Winnebago 1701—Faribault	Gen	Part	11	4	46	4	200
Winnebago Hospital	Gen	Part					
Winona 20,500—Winona	Gen	NPAssn	112	17	224	40	1,930
Winona General Hospital	Gen	NPAssn					

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Worthington, 3878—Nobles	TB	County	54			46	51
Southwestern Minnesota Sanatorium	Gen	Part	20	8	106	16	614
Worthington Clinic Hosp	Gen	Indiv	10	6	31	6	174
Worthington Hospital	Gen	Indiv					
Related Institutions							
Anoka 4801—Anoka	Ment	State	1,480			1,445	100
Anoka State Hospital	Ment	State					
Barrett 368—Grant	Surg	Indiv	10		1	1	46
Powers Hospital	Surg	Indiv					
Bertha 490—Todd	Gen	Indiv	21	8	76	7	344
Thiel Hospital	Gen	Indiv					
Braham 579—Isanti	Gen	Indiv	12	5	60	7	360
Braham Hospital	Gen	Indiv					
Buhl 1634—St Louis	Inst	County	40			29	0
Range Hospital	Inst	County					
Caledonia 1554—Houston	Gen	Indiv	16	8	61	8	369
Caledonia Hospital	Gen	Indiv					
Cambridge 1183—Isanti	Gen	Indiv					
Minnesota Colony for Feeble minded	MeDe	State	1,108			0.0	0.0
Cokato 1120—Wright	Gen	Indiv	12	6	34	7	203
Cokato Hospital	Gen	Indiv					
Detroit Lakes 3675—Becker	Gen	Indiv	7	2	4	2	49
Detroit Hospital	Gen	Indiv					
Duluth 101463—St Louis	Inst	County	65			58	1,613
Hearing Hospital	Inst	County					
Ellsworth 644—Nobles	Gen	Indiv	10	3		3	60
Ellsworth Hospital	Gen	Indiv					
Ely 6156—St Louis	Iso	City	16			3	54
Detention Hospital	Iso	City					
Faribault 12767—Rice	MeDe	State	2,387	10	7	220	072
Minnesota School for Feeble minded	MeDe	State					
Glenwood 2220—Pope	Gen	Part	12	3	44	8	345
Glenwood Hospital	Gen	Part					
Greenbush 387—Roseau	Gen	Indiv	8	3	57	6	316
General Hospital	Gen	Indiv					
Hastings 5086—Dakota	MeDe	State	1,118			1,072	117
Hastings State Hospital	MeDe	State					
Latto Hospital	Gen	Indiv	20	5	9	10	100
St Francis Hospital	Gen	Indiv	17	3	30	15	203
St Raphael Hospital	Gen	Indiv	17	4	No data supplied		
Hibbing 10666—St Louis	Iso	City	25			2	26
Hibbing Detention Hosp	Iso	City					
Long Prairie 1804—Todd	Gen	Part	12	3	7	4	144
Long Prairie Hospital	Gen	Part					
Madella 1397—Watsonwan	Gen	Indiv	13	4	66	5	302
Madella Hospital	Gen	Indiv					
Minneapolis 464306—Hennepin	Conv	NPAssn	60			46	587
Franklin Hospital	Conv	NPAssn	20			197	197
Glenwood Hills Hospital	Conv	NPAssn	36			No data supplied	
Homewood Hospital	Conv	NPAssn	27			18	108
Minneapolis Sanitarium	N&M	Indiv	20			0	206
Minnesota Sanitarium	N&M	Indiv					
Minnesota Soldiers Home	Inst	State	85			68	30
Hospital	Chr	City	186			161	372
Parkview Sanatorium	N&M	Indiv	10			5	10
Portland Resthome	N&M	Part	19			14	120
Rest Hospital	Conv	NPAssn	39			37	71
Vocational Hospital	Conv	NPAssn					
Women's Welfare League	Conv	NPAssn	20			17	201
Home for Convalescents	Conv	NPAssn					
Morris 2474—Stevens	Gen	NPAssn	20	6	70	10	41
Stevens County Hospital	Gen	NPAssn					
Mudbaden—Scott	Conv	Corp	75			22	1,906
Mudbaden Sulphur Springs	Conv	Corp					
Nicollet 434—Nicollet	Gen	Indiv	10	2	26	3	119
Nicollet Hospital	Gen	Indiv					
Owatonna 7604—Steele	Inst	State	60			20	871
Minnesota State Public School	Inst	State					
Pelican Rapids 1360—Otter Tail	Gen	Indiv	8	4	71	2	70
Dr Boysen's Hospital	Gen	Indiv	7	3	44	3	103
Pelican Rapids Hospital	Gen	Indiv					
Pipestone 3489—Pipestone	Gen	IA	36	1	3	20	24
Pipestone Indian Hospital	Gen	IA					
Red Wing 9629—Goodhue	Inst	State	22			130	
Minnesota State Training School for Boys	Inst	State					
St Cloud 21000—Stearns	Inst	State	30			20	1,149
Minnesota State Reformatory Hospital	Inst	State					
St Paul 271006—Ramsey	TB	CyCo	80			73	18
Children's Preventorium of Ramsey County	TB	CyCo	10			9	13
Mrs Robbins Rest Home	N&M	Indiv					
Salvation Army Home and Hospital	Mat	Church	75	10	97	45	197
Samaritan Hospital	Gen	NPAssn	26	7	60	11	370
Sauk Centre 2716—Stearns	In (Cen	State	10	5	17		16
Home School for Girls (Higbee Hospital)	Gen	Indiv	10	4	14	2	104
Long Hospital	Gen	Indiv					
Shakopee 2025—Scott	Conv	Corp	75			2	1,200
Shakopee Sanitarium	Conv	Corp					
Mudoura Sanitarium	Conv	Corp					
Stillwater 177—Washington	Inst	State	60			40	720
Minnesota State Prison Hospital	Inst	State					

Key to symbols and abbreviations is on page 986



## MINNESOTA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Watertown 594—Carver	Gen	Indiv	11	2	No data supplied		
Shrader and Lee Hospital	Gen	NP Assn	13	4	22	6	144
Wayzata 1100—Hennepin	Gen	NP Assn	13	4	22	6	144
Winnetonka Hospital	Gen	Indiv	12	0	64	0	287
Wheaton 1249—Traverse	Gen	Indiv	12	0	64	0	287
Wheaton Hospital	Gen	Indiv	12	0	64	0	287
Willmar 6173—Kandiyohi	Gen	Indiv	12	0	64	0	287
Willmar State Hospital	Ment	State	1 461		1 403		331
		Rated capacity	1 400				
Worthington 3 878—Nobles	Gen	Part	8	5	45	5	243
General Hospital	Gen	Part	8	5	45	5	243
Summary for Minnesota							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	161	19 006	15 871	229 215			
	06	9 086	8 090	19 043			
Totals	217	28 092	23 961	248 258			
Refused registration	10	238					

## MISSISSIPPI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aberdeen 3 920—Monroe	Gen	NP Assn	20	3	10	0	300
Aberdeen Hospital	Gen	NP Assn	20	3	10	0	300
Amory 3 214—Monroe	Gen	NP Assn	30	3	20	16	616
Gilmore Sanitarium	Gen	NP Assn	30	3	20	16	616
Biloxi 14 800—Harrison	Gen	NP Assn	50	8	110	19	942
Biloxi Hospital	Gen	NP Assn	50	8	110	19	942
Veterans Admin Facility	Gen	Vet	207			167	1 731
Booneville 1 703—Prentiss	Gen	NP Assn	40	2	11	16	686
North East Mississippi Hos	Gen	NP Assn	40	2	11	16	686
pital	Gen	NP Assn	40	2	11	16	686
Brookhaven 5 288—Lincoln	Gen	NP Assn	00	7	56	15	798
Kings Daughters Hosp	Gen	NP Assn	00	7	56	15	798
Canton 4 720—Madison	Gen	NP Assn	20	5	12	10	400
Madison County Kings Daugh	Gen	NP Assn	20	5	12	10	400
ters Hospital	Gen	NP Assn	20	5	12	10	400
Centerville 1 344—Wilkinson	Gen	Part	28	4	32	16	668
Feld Memorial Hospital	Gen	Part	28	4	32	16	668
Clarksdale 10 034—Conhoma	Gen	NP Assn	19	5	61	4	029
Clarksdale Hospital	Gen	NP Assn	19	5	61	4	029
Columbia 4 833—Marion	Gen	Indiv	30	4	No data supplied		
Columbia Clinic Hospital	Gen	Indiv	30	4	No data supplied		
Columbus 10 743—Lowndes	Gen	Indiv	25	5	27	5	132
Columbus Hospital	Gen	Indiv	35	7	44	9	407
Fite Hospital	Gen	Indiv	35	7	44	9	407
Corinth 6 720—Alcorn	Gen	Indiv	12	3	46	0	200
Corinth Hospital	Gen	NP Assn	00	8	33	15	076
McRae Hospital	Gen	NP Assn	00	8	33	15	076
Electric Mills 1 684—Kemper	Gen	NP Assn	00	6	30	10	606
Hospital	Gen	NP Assn	00	6	30	10	606
Greenville 14 807—Washington	Gen	NP Assn	100	14	131	60	2 304
Kings Daughters Hospital	Gen	NP Assn	100	14	131	60	2 304
Greenwood 11 123—Leflore	Gen	CyCo	40	8	100	23	746
Greenwood Leflore Hosp	Gen	CyCo	40	8	100	23	746
Grenada 4 340—Grenada	Gen	Part	00	0	02	10	1 286
Grenada General Hospital	Gen	Part	00	0	02	10	1 286
Gulfport 12 047—Harrison	Gen	NP Assn	70	6	No data supplied		
Kings Daughters Hospital	Gen	NP Assn	70	6	No data supplied		
Veterans Admin Facility	Ment	Vet	788		601	02	
Hattiesburg 18 601—Forrest	Gen	Church	70	12	210	29	1 420
Methodist Hospital	Gen	Church	70	12	210	29	1 420
South Mississippi Infirmary	Gen	Indiv	60	15			
Houston 1 477—Chickasaw	Gen	NP Assn	30	3	27	16	783
Houston Hospital	Gen	NP Assn	30	3	27	16	783
Jackson 48 282—Hinds	Gen	NP Assn	70	12	230	30	2 080
Jackson Infirmary	Gen	NP Assn	70	12	230	30	2 080
Medical and Surgical Clinic	Gen	Indiv	70	5	10	17	1 889
Mississippi Baptist Hosp	Gen	Church	110	10	300	79	4 640
Mississippi State Charity	Gen	State	72	6	28	06	8 024
Hospital	Gen	State	72	6	28	06	8 024
Welch's Sanitarium	N&M	Indiv	14				Estab 1937
Laurel 18 017—Jones	Gen	Indiv	00	6	183	22	1 769
Laurel General Hospital	Gen	Indiv	00	6	183	22	1 769
South Mississippi Charity	Gen	State	60	6	82	44	2 033
Hospital	Gen	State	60	6	82	44	2 033
Levington 2 500—Holmes	Gen	County	25	2	46	10	680
Holmes County Community	Gen	County	25	2	46	10	680
Hospital	Gen	County	25	2	46	10	680
Macon 0 190—Noxubee	Gen	Indiv	20	3	20	12	490
Macon Hospital	Gen	Indiv	20	3	20	12	490
McComb 10 007—Pike	Gen	Indiv	23	2	08	14	1 000
McComb City Hospital	Gen	Indiv	23	2	08	14	1 000
McComb Infirmary	Gen	Indiv	20	4	60	13	660
Meridian 31 904—Lauderdale	Gen	Corp	40	0	91	14	1 000
Anderson Infirmary	Gen	Corp	40	0	91	14	1 000
East Mississippi State Hosp	Ment	State	779		790	358	
		Rated capacity	834				
Hoye's Sanitarium	N&M	Indiv	26			10	170
Natty Hersee Hospital	Gen	State	70	12	80	52	2 223
Meridian Sanitarium and	Gen	Indiv	65	15	87	22	1 200
Clinic	Gen	Indiv	65	15	87	22	1 200
Dr F G Riley's Hospital	Gen	Indiv	35	6	24	9	504
and Clinic	Gen	Indiv	35	6	24	9	504
Rush's Infirmary	Gen	Part	50	6	87	24	1 410

## MISSISSIPPI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Natchez 13 422—Adams	Gen	State	60	8	272	53	2 320
Natchez Charity Hospital	Gen	State	60	8	272	53	2 320
Natchez Sanatorium	Gen	Corp	00	0	81	18	910
New Albany 3 187—Union	Gen	Indiv	30	2	72	10	409
Mayes Hospital	Gen	Indiv	30	2	72	10	409
New Albany Hospital and	Gen	NP Assn	10	3	26	5	236
Clinic	Gen	NP Assn	10	3	26	5	236
Newton 2 011—Newton	Gen	Corp	20	4	20	8	063
Newton Infirmary	Gen	Corp	20	4	20	8	063
Oxford 2 890—Lafayette	Gen	Corp	30	4	38	12	912
Bramlett Hospital	Gen	Corp	30	4	38	12	912
Oxford Hospital	Gen	Indiv	30	5	50	19	1 226
Pascagoula 4 330—Jack on	Gen	County	20	4	40	14	367
Jack on County Hospital	Gen	County	20	4	40	14	367
Philadelphia 2 560—Neshoba	Gen	IA	28	7	35	17	731
Choctaw Mississippi Hosp	Gen	IA	28	7	35	17	731
Pleayune 4 698—Pearl River	Gen	Indiv	24	2	33	8	302
Martin Sanatorium	Gen	Indiv	24	2	33	8	302
Sanatorium 200—Simpson	Gen	Indiv	24	2	33	8	302
Mississippi State Tuberculo	TB	State	400			275	302
losis Sanatorium	TB	State	400			275	302
Starkville 3 612—Oktibbeha	Gen	Indiv	21	2	10	10	000
Oktibbeha Hospital	Gen	Indiv	21	2	10	10	000
Tupelo 6 361—Lee	Gen	NP Assn	49	10			Estab 1937
North Mississippi Commu	Gen	NP Assn	49	10			Estab 1937
nity Hospital	Gen	NP Assn	49	10			Estab 1937
Tylertown 1 102—Walthall	Gen	Indiv	15	2	28	7	388
Tylertown Hospital	Gen	Indiv	15	2	28	7	388
Vicksburg 22 943—Warren	Gen	NP Assn	75	6	264	65	2 944
Mississippi State Charity	Gen	NP Assn	75	6	264	65	2 944
Hospital	Gen	NP Assn	75	6	264	65	2 944
Vicksburg Hospital	Gen	NP Assn	75	6	264	65	2 944
Vicksburg Infirmary	Gen	NP Assn	75	6	264	65	2 944
Vicksburg Sanitarium and	Gen	NP Assn	75	6	264	65	2 944
Crawford Street Hospital	Gen	NP Assn	75	6	264	65	2 944
Water Valley 3 738—Yalobusha	Gen	Part	25	4	17	5	318
Water Valley Hospital	Gen	Part	25	4	17	5	318
West Point 4 677—Clay	Gen	Indiv	20	4	35	12	425
Ivy Hospital	Gen	Indiv	20	4	35	12	425
Whitfield—Rankin	Ment	State	3 265			3 060	1 661
Mississippi State Hospital	Ment	State	3 265			3 060	1 661
		Rated capacity	3 500				
Winona 2 607—Montgomery	Gen	NP Assn	30	2	32	13	570
Winona Infirmary	Gen	NP Assn	30	2	32	13	570
Yazoo City 5 579—Yazoo	Gen	NP Assn	30	3	39	9	676
Kings Daughters Hospital	Gen	NP Assn	30	3	39	9	676
Related Institutions							
Baldwyn 1 106—Lee	Gen	Indiv	10	1	6	4	208
Baldwyn Hospital	Gen	Indiv	10	1	6	4	208
Biloxi 14 800—Harrison	Inst	State	60			30	35
Jefferson Davis Soldiers	Inst	State	60			30	35
Home	Inst	State	60			30	35
Ellisville 2 127—Jones	McDe	State	400			No data supplied	
Ellisville State School	McDe	State	400			No data supplied	
Greenville 14 807—Washington	Gen	Part	60	2	8	30	970
Colored Kings Daughters	Gen	Part	60	2	8	30	970
Hospital	Gen	Part	60	2	8	30	970
Greenwood 11 123—Leflore	Gen	Indiv	10			8	202
Greenwood Colored Hospital	Gen	Indiv	10			8	202
Meridian 31 904—Lauderdale	TB	NP Assn	40			20	31
Kings Daughters Tuberculo	TB	NP Assn	40			20	31
sis Hospital	TB	NP Assn	40			20	31
Okolona 2 230—Chickasaw	Gen	Indiv	10	2	10	2	100
Wicks Hospital	Gen	Indiv	10	2	10	2	100
State College 220—Oktibbeha	Inst	State	44			11	624
James Z George Memorial	Inst	State	44			11	624
Hospital	Inst	State	44			11	624
University 15—Lafayette	Inst	State	20			6	403
University of Mississippi	Inst	State	20			6	403
Hospital	Inst	State	20			6	403
Summary for Mississippi							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	60	8 201	6 163	72 925			
	9	660	410	2 098			
Totals	74	8 870	6 573	74 023			
Refused registration	2	72					

## MISSOURI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Bonne Terre 4 021—St. Francis	Gen	NP Assn	30	5	67	13	062
Bonne Terre Hospital	Gen	NP Assn	30	5	67	13	062
Boonville 6 435—Cooper	Gen	Church	70	14	87	46	1 977
St. Joseph's Hospital	Gen	Church	70	14	87	46	1 977
Butler 2 706—Bates	Gen	Indiv	20	3	73	8	491
Butler Memorial Hospital	Gen	Indiv	20	3	73	8	491
California 2 384—Monteau	Gen	Indiv	33	2	4	11	700
Latham Sanitarium	Gen	Indiv	33	2	4	11	700
Canton 2 044—Lewis	Gen	Indiv	13	2	12	3	102
Canton Community Hosp	Gen	Indiv	13	2	12	3	102
Cape Girardeau 16 227—Cape Girardeau	Gen	Church	67	15	197	47	1 844
St. Francis Hospital	Gen	Church	67	15	197	47	1 844
Southeast Missouri Hosp	Gen	NP Assn	70	12	129	41	1 664
Carthage 9 736—Jasper	Gen	NP Assn	70	12	129	41	1 664
McCune Brooks Hospital	Gen	City	44	6	84	15	809

Key to symbols and abbreviations is on page 986

## MISSOURI—Continued

Key to symbols and abbreviations is on page 986

## MISSOURI—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Marthasville 394—Warren Evangelical Emmaus Home for Epileptics and Feeble minded	McDe	Church	12			104	14
Mountain Grove 229—Wright Ryan Hospital	Gen	Indiv	10	3	14	3	80
Rolla 3 670—Phelps Missouri School of Mines Hospital	Inst	State	14			2	130
St Charles 10 491—St Charles Evangelical Emmaus Home for Epileptics and Feeble minded	McDe	Church	142			127	30
St James 1 294—Phelps State Federal Soldiers Home Hospital	Inst	State	58			30	106
St Joseph 80 933—Buchanan Sunnyslope Hospital	TbIso	City	30	6	No data supplied		
St Louis 821 960—St Louis City City Infirmary	Inst	City	9			92	20
Hospital of Masonic Home Night and Day Camp for Children	Inst	Frat	123			80	398
St Louis Training School Salvation Army Womens Home and Hospital	Chil	NPAesn	80			56	107
Sedalia 20 806—Pettis City Hospital No 2 (col)	McDe	City	506			487	42
Springfield 57 527—Greene City Hospital	Mat	Church	6	50	90	4	103
Valley Park 1 712—St Louis Ridge Farm	Gen	City	12	3	2	5	81
Warrensburg 5 146—Johnson Warrensburg Clinic	Gen	City	16	2			Estab 1037
Webster Groves 16 487—St Louis Miriam Convalescent Home	Unit of St Louis Children's Hospital						
West Plains 3 33—Howell Cottage Hospital	Gen	Part	10	1	4	2	112
	Gen	Frat	30			22	40
	Gen	Indiv	7	4	40	5	13
Summary for Missouri							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	120	26 185	21 917	22 820			
Totals	2	2 911	2 491	3 768			
Refused registration	145	29 066	24 408	229 088			
	27	1 295					

## MONTANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Anaconda 12 494—Deerlodge St Ann's Hospital	Gen	Church	7	8	189	50	1 20
Billings 16 380—Yellowstone Billings Deaconess Hospital	Gen	Church	58	12	292	46	1 83
St Vincent Hospital	Gen	Church	140	16	360	97	2 279
Bozeman 6 855—Gallatin Bozeman Deaconess Hosp	Gen	Church	60	12	219	42	1 31
Browning 1 172—Glacier Blackfeet Hospital	Gen	IA	42	8			New building
Butte 39 532—Silver Bow Murray Hospital	Gen	Corp	120	12	207	73	2 666
St James Hospital	Gen	Church	1	26	110	3	0 114
Choteau 926—Teton Choteau Hospital	Gen	Indiv	16	4	26	11	3 34
Conrad 1 490—Pondera St Mary's Hospital	Gen	Church	59	10	116	27	1 027
Crow Agency 536—Big Horn Crow Indian Hospital	Gen	IA	18	6		17	444
Deer Lodge 3 010—Powell Montana State Tuberculosis Sanitarium	TB	State	200			200	2 20
St Joseph Hospital	Gen	Church	50	21	90	30	396
Dillon 2 472—Beaverhead Barrett Hospital	Gen	Corp	22	4	74	7	463
Ft Benton 1 109—Chouteau St Clara Hospital	Gen	Church	40	6	51	16	399
Ft Harrison 500—Lewis and Clark Veterans Admin Facility	Gen	Vet	14			94	768
Ft Missoula (Missoula F O) 400—Missoula Station Hospital	Gen	Army	36			3	63
Ft Peck 5 500—Valley Ft Peck Hospital	Gen	Army	3			23	1 769
Glasgow 2 216—Valley France Mahon Deaconess Hospital	Gen	Church	75	12	206	51	2 17
Glendive 4 679—Dawson Dawson County Hospital	Gen	County	2	5	64	15	4 4
Northern Pacific Hospital	Gen	NPAesn	60	6	52	39	1 3
Great Falls 28 822—Cascade Columbus Hospital	Gen	Church	290	50	424	133	3 562
Montana Deaconess Hosp	Gen	Church	160	27	380	101	2 509
Hamilton 1 839—Ravalli Marcus Daly Memorial Hosp	Gen	NPAesn	28	6	129	14	8
Hardin 1 169—Big Horn Hardin General Hospital	Gen	Corp	25	4	76	11	392
Harlem 708—Blaine Ft Belknap Indian Hospital and Sanitarium	Gen	IA	45	8		24	6

## MONTANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Havre 6 372—Hill Kennedy Deaconess Hosp	Gen	Church	41	12	126	35	1 1
Sacred Heart Hospital	Gen	Church	75	13	105	55	2 179
Helena 11 803—Lewis and Clark St John Hospital	Gen	Church	40	12	196	35	1 168
St Peter's Hospital	Gen	Corp	54	10	147	36	1 136
Jordan 401—Garfield Good Samaritan Hospital	Gen	Church	1	5	51	8	212
Kalspell 6 094—Flathead Kalspell General Hospital	Gen	Church	42	10	14	23	1 162
Lame Deer 89—Rosebud Tongue River Agency Hosp	Gen	IA	47	6	23	21	639
Lewistown 5 308—Fergus St Joseph's Hospital	Gen	Church	114	16	216	6	2 327
Libby 1 702—Lincoln Libby General Hospital	Gen	Indiv	14	4	60	8	315
Livingston 6 391—Park Park Hospital	Gen	Indiv	22	6	15	15	4 4
Viles City 7 175—Custer Miles City Hospital (Holy Rosary Hospital)	Gen	Church	65	8	100	60	1 6
Missoula 14 657—Missoula Northern Pacific Beneficial Association Hospital	Indus	NPAesn	7			44	1 619
St Patrick Hospital	Gen	Church	100	12	238	74	2 731
Thornton Hospital	Gen	Part	38	12	127	24	1 04
Plentywood 1 226—Sheridan Sheridan Memorial Hosp	Gen	NPAesn	18	5	50	7	228
Poplar 1 046—Roosevelt Ft Peck Indian School Hospital	Gen	IA	25	7	91	23	800
Roundup 2 577—Musselshell Musselshell Valley Hosp	Gen	Indiv	20	6			No data supplied
St Ignace 727—Lake Holy Family Hospital	Gen	Church	31	6	87	14	1 013
Sidney 2 010—Richland Sidney Deaconess Hospital	Gen	Church	24	6	124	17	787
Warm Springs 1 900—Deerlodge Montana State Hospital	Ment	State	1 900			1 845	1 61
Related Institutions							
Billings 16 380—Yellowstone Yellowstone County Hosp	Gen	County	18	3	33	13	2 38
Butte 39 532—Silver Bow Silver Bow County Hosp	InstGen	County	1	5	11	120	373
Great Falls 28 822—Cascade Detention Hospital	Iso	CyCo	3			5	92
Helena 11 803—Lewis and Clark Florence Crittenton Home	Mat	NPAesn	6	17	65	3	76
Lewis and Clark County Hospital	InstGen	County	54	4	12		2 0
Lewistown 5 308—Fergus Fergus County Hospital	Gen	County	1	4	43	12	3 37
Livingston 6 391—Park Robinson Hospital	Gen	Indiv	7	7	40	2	59
Polson 1 455—Lake Hotel Dieu Hospital	Gen	Church	2	5	28	6	2 0
Scobey 1 259—Daniels Scobey Clinic Hospital	Gen	Indiv	20	4	36	5	1 5
Shelby 2 004—Toole New Shelby Hospital	Gen	Indiv	20	5	15	4	124
Terry 779—Prairie Lutheran Good Samaritan Hospital	Gen	Church	19	6	30	9	216
White Sulphur Springs 570—Veagher McKay Hospital	Gen	Indiv	12	3	10	2	80
Wolf Point 1 039—Roosevelt Wolf Point General Hosp	Gen	Indiv	20	6	34	2	725
Summary for Montana							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	46	5 935	4 911	53 038			
Totals	13	401	208	3 03			
Refused registration	59	6 336	5 119	56 078			
	6	106					

## NEBRASKA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Albion 1 378—Brown Albion Hospital	Gen	Part	28	3	121	10	636
Alliance 6 669—Box Butte St Joseph's Hospital	Gen	Church	80	12	148	63	1 671
Arnold 899—Custer Arnold Hospital	Gen	Indiv	1	3	32		16
Auburn 3 068—Nemaha Auburn Hospital	Gen	Indiv	10	4	21	4	1 7
Tulsa General Hospital	Gen	Indiv	10	4	50		243
Aurora 2 715—Hamilton Aurora Hospital	Gen	Indiv	16	8	19	7	2 6
Beatrice 10 297—Gage Beatrice Sanitarium	Gen	Indiv	20	4			
Lutheran Hospital	Gen	Church	4	8		20	76
Mennonite Deaconess Home and Hospital	Gen	Church	20	10	19	23	800
Broken Bow 2 715—Custer Broken Bow Hospital	Gen	Indiv	2	4	4	8	218

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Cambridge 1203—Furnas	Gen	Indiv	20	2	15	5	206
Republican Valley Hosp	Gen	City	23	7	30	10	504
Chadron 4606—Dawes	Gen	City	23	7	30	10	504
Chadron Municipal Hosp	Gen	City	23	7	30	10	504
Columbus 6808—Platte	Gen	Church	30	5	181	18	1630
Lutheran Good Samaritan Hospital	Gen	Church	120	12	143	40	1422
St Mary's Hospital	Gen	Church	13	4	27	4	230
David City 2333—Butler	Gen	Church	13	4	27	4	230
David City Hospital	Gen	Church	13	4	27	4	230
Fairbury 6192—Jefferson	Gen	Indiv	15	4	58	9	414
Fairbury Hospital	Gen	Indiv	15	4	58	9	414
Falls City 5787—Richardson	Gen	Indiv	30	10	15	9	340
Falls City Hospital	Gen	Indiv	30	10	15	9	340
Ft Crook 70—Sargy	Gen	Army	50			42	1106
Station Hospital	Gen	Army	50			42	1106
Grand Island 1804—Hall	Gen	Church	130	10	194	57	1701
St Francis Hospital	Gen	Church	130	10	194	57	1701
Hartington 1568—Cedar	Gen	Indiv	16	6	7	5	211
St John's Hospital	Gen	Indiv	16	6	7	5	211
Hastings 15490—Adams	Gen	Indiv	16	6	7	5	211
Mary Lanning Memorial Hospital	Gen	NPA's'n	85	15	204	50	1946
Holdrege 3263—Phelps	Gen	Indiv	18	5	33	7	271
Holdrege Hospital	Gen	Indiv	18	5	33	7	271
Imperial 946—Chase	Gen	NPA's'n	10	4	88	8	462
Imperial Community Hosp	Gen	NPA's'n	10	4	88	8	462
Inglewood 1699—Adams	Gen	State	150			1529	200
Hastings State Hospital	Gen	State	150			1529	200
Kearney 8575—Buffalo	Gen	Church	53	12	110	22	935
Good Samaritan Hospital	Gen	Church	53	12	110	22	935
Hospital for the Tuberculous	Gen	State	160			150	187
Lincoln 70933—Lancaster	Gen	Church	100	14	296	84	2410
Bryan Memorial Hosp	Gen	Church	100	14	296	84	2410
Green Gables Dr Benj F	Gen	Corp	115	4	16	110	724
Bailey Sanatorium	Gen	Corp	115	4	16	110	724
Lincoln Gen'l Hosp	Gen	State	115	20	374	99	3242
Lincoln State Hospital	Gen	State	115	20	374	99	3242
Nebraska Orthopedic Hosp	Gen	State	110			97	166
St Elizabeth's Hospital	Gen	State	110			97	166
Veterans Admin Facility	Gen	State	110			97	166
Loup City 1446—Sherman	Gen	Indiv	10	4	39	6	290
Loup City Hospital	Gen	Indiv	10	4	39	6	290
Lynch 498—Boyd	Gen	Church	18	3	22	5	212
Sacred Heart Hospital	Gen	Church	18	3	22	5	212
McCook 6688—Redwillow	Gen	Church	60	10	114	24	950
St Catherine of Sienna Hos	Gen	Church	60	10	114	24	950
Minden 1716—Kearney	Gen	Indiv	12	10	62	6	250
Seeley Hospital	Gen	Indiv	12	10	62	6	250
Nebraska City 7230—Otoe	Gen	Church	50	15	174	28	871
St Mary's Hospital	Gen	Church	50	15	174	28	871
Norfolk 10717—Madison	Gen	Church	75	5	183	28	1055
Lutheran Hospital	Gen	Church	75	5	183	28	1055
Norfolk State Hospital	Gen	Church	75	5	183	28	1055
Our Lady of Lourdes Hosp	Gen	Church	30	5	62	12	476
Verges Sanatorium	Gen	Church	30	5	62	12	476
North Platte 12061—Lincoln	Gen	Church	64	10	108	38	1009
St Mary Hospital	Gen	Church	64	10	108	38	1009
Oakland 1433—Burt	Gen	Indiv	10	3	46	5	197
Oakland Community Hosp	Gen	Indiv	10	3	46	5	197
Omaha 214006—Douglas	Gen	Church	138	12	243	93	3179
Bishop Clarkson Memorial Hospital	Gen	Church	138	12	243	93	3179
Creighton Memorial St Joseph's Hospital	Gen	Church	362	33	787	218	7587
Douglas County Hospital	Gen	County	412	12	111	381	2968
Douglas County Psychiatric Hospital	Gen	County	412	12	111	381	2968
Evangelical Covenant Hos	Gen	Church	86	16	203	39	2603
Immanuel Deaconess Insti	Gen	Church	118	24	468	58	3877
tute	Gen	Church	111	8	140	49	1560
Lutheran Hospital	Gen	Church	111	8	140	49	1560
Nebraska Methodist Episco	Gen	Church	176	24	411	110	4211
pal Hospital and Deacon	Gen	Church	176	24	411	110	4211
ess Home	Gen	NPA's'n	80	12	185	66	4084
Nicholas Senn Hospital	Gen	NPA's'n	140	20	382	85	2962
St Catherine's Hosp	Gen	Church	8		1	5	190
Station Hospital	Gen	Army	8		1	5	190
University of Nebraska Hos	Gen	State	210	20	422	170	3508
pital	Gen	State	210	20	422	170	3508
Ord 2226—Valley	Gen	Indiv	15	2	6	6	215
Ord Hospital	Gen	Indiv	15	2	6	6	215
Oxford 115—Furnas	Gen	Corp	14	5	22	6	327
Oxford General Hospital	Gen	Corp	14	5	22	6	327
Pawnee City 1573—Pawnee	Gen	Indiv	26	4	70	15	626
Pawnee Hospital	Gen	Indiv	26	4	70	15	626
Scottsbluff 5463—Scotts Bluff	Gen	Indiv	25	6	201	27	800
Fairacre Hospital	Gen	Indiv	25	6	201	27	800
West Nebraska Methodist	Gen	Church	65	12	177	43	1005
Episcopal Hospital	Gen	Church	65	12	177	43	1005
Seward 2737—Seward	Gen	Part	20	5	24	10	307
Seward Clinic Hospital	Gen	Part	20	5	24	10	307
Seward Hospital	Gen	Part	20	5	24	10	307
Sidney 3506—Cheyenne	Gen	Indiv	12	4	45	8	201
Roche Hospital	Gen	Indiv	12	4	45	8	201
Taylor Hospital	Gen	Indiv	12	4	45	8	201
Stuart 763—Holt	Gen	Indiv	20	3	23	13	500
Wilson Hospital	Gen	Indiv	20	3	23	13	500

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Valentine 1672—Cherry General Hospital	Gen	Indiv	15	5	30	8	41
Wahoo 2689—Saunders Community Hospital	Gen	Indiv	18	6	74	11	681
Winnebago 603—Thurston	Gen	IA	63	9	78	22	800
Winnebago Indian Hosp	Gen	IA	63	9	78	22	800
York 5712—York	Gen	Church	50	10	80	19	800
Lutheran Hospital	Gen	Church	12	6	20	3	106
York Clinic and Clinic Hosp	Gen	Part	12	6	20	3	106
Related Institutions							
Atkinson 1144—Holt	Gen	Indiv	8	3	2	2	6
Atkinson General Hospital	Gen	Indiv	8	3	2	2	6
Axtell 328—Kearney	MeDe	Church	140			140	9
Bethphage Inner Mission	MeDe	Church	140			140	9
Beatrice 10297—Gage	MeDe	State	1373			1319	100
Nebraska Institution for Feebleminded	MeDe	State	1373			1319	100
Beemer 571—Cumling	Gen	Indiv	10	2	12	1	57
Beemer Hospital	Gen	Indiv	10	2	12	1	57
Dalton 403—Cheyenne	Gen	Indiv	10	3	2	3	80
Pioneer Memorial Hospital	Gen	Indiv	10	3	2	3	80
Farnam 394—Dawson	Gen	Indiv	12	3	66	3	934
Reeves Memorial Hospital	Gen	Indiv	12	3	66	3	934
Fremont 11407—Dodge	Gen	Church	20	5	107	13	771
Lutheran Good Samaritan Hospital	Gen	Church	20	5	107	13	771
Friend 1214—Saline	Gen	City	11	4	81	5	100
Warren Memorial Hospital	Gen	City	11	4	81	5	100
Geneva 1662—Fillmore	Gen	Indiv	15	6		Estab 1900	
Geneva General Hospital	Gen	Indiv	15	6		Estab 1900	
Genoa 1089—Nance	Gen	Part	4	3	14	1	110
Emergency Hospital	Gen	Part	4	3	14	1	110
Hastings 15490—Adams	Gen	Indiv	10	2			
Dr Egbert Hospital	Gen	Indiv	10	2			
Hebron 1804—Thayer	Gen	Indiv	20	5	30	8	450
Blue Valley Hospital	Gen	Indiv	20	5	30	8	450
Kimball 1711—Kimball	Gen	Part	10	4	16	4	224
Kimball Hospital	Gen	Part	10	4	16	4	224
Lexington 2962—Dawson	Gen	Corp	20	6	30	9	305
Lexington Community Hospital	Gen	Corp	20	6	30	9	305
Lincoln 70933—Lancaster	Inst	State	24			12	000
Nebraska State Penitentiary Hospital	Inst	State	24			12	000
Milford 832—Seward	Inst	State	12	11	40	3	41
Nebraska Industrial Home	Inst	State	12	11	40	3	41
Nebraska Soldiers and Sailors Home Hospital	Inst	State	58			40	50
Odell 472—Gage	Gen	Indiv	9	3	26	7	248
Odell General Hospital	Gen	Indiv	9	3	26	7	248
Omaha 214006—Douglas	Mat	Church	56	15	70	47	100
Salvation Army Women's Home and Hospital	Mat	Church	56	15	70	47	100
Orchard 500—Antelope	Gen	Indiv	7	3	2	1	8
Orchard Hospital	Gen	Indiv	7	3	2	1	8
Plainview 1216—Pierce	Gen	NPA's'n	7	2	13	2	100
Plainview General Hosp	Gen	NPA's'n	7	2	13	2	100
Stratton 603—Hitchcock	Gen	Indiv	10	3	13	3	100
Dr Stewart's Private Hosp	Gen	Indiv	10	3	13	3	100
Sutherland 703—Lincoln	Gen	NPA's'n	10	4	15	3	171
Sutherland Hospital	Gen	NPA's'n	10	4	15	3	171
Sutton 1540—Clay	Gen	Indiv	12	2	20	3	200
Sutton Hospital	Gen	Indiv	12	2	20	3	200
Tecumseh 1829—Johnson	Gen	Indiv	10	3	23	4	164
Tecumseh Hospital	Gen	Indiv	10	3	23	4	164
Tilden 1106—Madison	Gen	Indiv	7	2	6	3	116
Tilden Hospital	Gen	Indiv	7	2	6	3	116
Walsh 1162—Thurston	Gen	Indiv	12	4	4	3	101
Dr Picotte Mem Hosp	Gen	Indiv	12	4	4	3	101
Westpoint 2220—Cumling	InstGen	Church	16	2	56	9	339
St Joseph Home and Hospital	InstGen	Church	16	2	56	9	339
Summary for Nebraska							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	69	827	6774	79921			
	30	1934	1663	6173			
Totals	99	10201	8437	86094			
Refused registration	17	40					
NEVADA							
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
East Fly 600—White Pine	Gen	NPA's'n	40	7	50	17	000
Stepston Valley Hospital	Gen	NPA's'n	40	7	50	17	000
Elko 3217—Elko	Gen	County	45	8	90	21	681
Elko General Hospital	Gen	County	45	8	90	21	681
Ely 3040—White Pine	Gen	County	50	4	53	21	674
White Pine County and Gen	Gen	County	50	4	53	21	674
eral Hospital	Gen	County	50	4	53	21	674
Las Vegas 5160—Clark	Gen	Corp	20	7	30	20	1912
Las Vegas Hospital	Gen	Corp	20	7	30	20	1912
Reno 19529—Washoe	MeDe	State	120			21	600
Nevada State Hospital	MeDe	State	120			21	600

## NEVADA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassincts	Number of Births	Average Census	Admissions
St Mary's Hospital	Gen	Church	54	12	163	51	1 707
Washoe General Hospital	Gen	County	69	15	285	47	1 821
Schurz 75—Mineral							
Walker River Indian Hosp	Gen	IA	34	4	35	18	400
Stewart 412—Ormsby							
Carson Indian Hospital	Gen	IA	32	4	19	26	356
Tonopah 2115—Nye							
Tonopah Mines Hospital	Gen	NP Assn	20	3	36	12	360
Winnemucca 1989—Humboldt							
Humboldt County General Hospital	Gen	County	50	5	55	25	414
Related Institutions							
Eureka 600—Eureka							
Eureka County Hospital	Gen	County	12	2	2	8	25
Hawthorne 328—Mineral							
Mineral County Hospital	Gen	County	20	2	18	17	97
Owyhee 265—Elko							
Western Shoshone Indian Agency Hospital	Gen	IA	20	2	24	8	178
Stewart 412—Ormsby							
Carson Indian School Hosp	Chil	IA	30			15	437
Yerington 1005—Lyon							
Lyon County Hospital	Gen	County	16			14	80
Summary for Nevada							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	11	795	491	7 707			
	5	98	62	817			
Totals	16	893	553	8,524			
Refused registration	1	300					

## NEW HAMPSHIRE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassincts	Number of Births	Average Census	Admissions
Berlin 20 018—Coos							
St Louis Hospital	Gen	Church	65	10	143	50	1 664
Claremont 12 377—Sullivan							
Claremont General Hosp	Gen	Corp	59	11	169	40	1 145
Concord 25 228—Merrimack							
Margaret Pillsbury General Hospital	Gen	NP Assn	112	18	244	69	2 410
New Hampshire Memorial Hospital	Gen	NP Assn	44	11	198	32	853
New Hampshire State Hospital	Ment	State	2 081			2 067	539
	Rated capacity	1 750					
Dover 13 553—Strafford							
Wentworth Hospital	Gen	City	69	15	221	53	1 693
East Derry 380—Rockingham							
Alexander Eastman Hosp	Gen	NP Assn	20	6	30	6	365
Epping 800—Rockingham							
Mitchell Memorial Hospital	Gen	County	32	6		Estab	1937
Exeter 4 872—Rockingham							
Exeter Hospital	Gen	NP Assn	40	12	260	37	1 191
Franklin 6 576—Merrimack							
Franklin Hospital	Gen	NP Assn	37	7	87	23	645
Glencoff 118—Grafton							
New Hampshire State Sanatorium	TB	State	140			102	62
Grasmere 200—Hillsboro							
Hillsborough County General Hospital	Gen	County	131	10	193	116	1 662
Hanover 3 043—Grafton							
Mary Hitchcock Memorial Hospital	Gen	NP Assn	142	13	218	94	3 334
Acene 13 794—Cheshire							
Elliot Community Hosp	Gen	NP Assn	70	15	280	61	2 092
Laconia 12 471—Belknap							
Laconia Hospital	Gen	Corp	80	25	228	68	2 027
Lancaster 2 887—Coos							
Lancaster Hospital	Gen	NP Assn	18	5	53	13	371
Littleton 4 558—Grafton							
Littleton Hospital	Gen	NP Assn	54	8	56	16	564
Manchester 76 834—Hillsboro							
Balch Hospital	Chil	NP Assn	30			16	246
Fillot Hospital	Gen	Corp	108	32	389	77	2 683
Lucy Hastings Hospital	Gen	Corp	25	6	8	16	325
Notre Dame de Lourdes Hospital	Gen	Church	85	15	194	62	1 607
Our Lady of Perpetual Help							
Maternity Hospital	Mat	Church	22	19	286	10	299
Sacred Heart Hospital	Gen	Church	62			60	2 312
Nashua 31 463—Hillsboro							
Nashua Memorial Hospital	Gen	NP Assn	84	16	234	61	2 046
St Joseph's Hospital	Gen	Church	105	20	220	60	1 912
New London 812—Merrimack							
New London Hospital	Gen	NP Assn	15	6	43	8	280
Newport 4 659—Sullivan							
Carrie F Wright Memorial Hospital	Gen	NP Assn	20	7	67	11	260
North Conway 1 600—Carroll							
Memorial Hospital	Gen	NP Assn	35	10	77	20	517
Pembroke—Merrimack							
Pembroke Sanatorium	TB	Corp	100			82	114
Peterborough 2 571—Hillsboro							
Peterborough Hospital	Gen	NP Assn	50	9	91	22	678

## NEW HAMPSHIRE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassincts	Number of Births	Average Census	Admissions
Plymouth 2,470—Grafton							
Emily Balch and Soldiers and Sailors Mem Hosp	Gen	NP Assn	29	8	116	20	637
Portsmouth 14 495—Rockingham							
Portsmouth Hospital	Gen	NP Assn	92	18	280	53	1 768
U S Naval Hospital	Gen	Navy	150			22	251
Rochester 10 209—Strafford							
Frable Memorial Hospital	Gen	NP Assn	28	8	191	22	1,933
Whitefield 1 693—Coos							
Morrison Hospital	Gen	NP Assn	56	8	35	14	594
Wolfeboro 2 358—Carroll							
Huggins Hospital	Gen	NP Assn	30	6	90	24	1 025
Woodsville 1 500—Grafton							
Cottage Hospital	Gen	NP Assn	24	8	115	16	615
Related Institutions							
Epping 1 672—Rockingham							
Rockingham County Farm Hospital	Inst	County	85				
Exeter 4 852—Rockingham							
Lamont Infirmary	Inst	NP Assn	53			10	440
Laconia 12 471—Belknap							
Laconia State School	MeDe	State	560			555	46
		Rated capacity	334				
Lebanon 7 053—Grafton							
Alice Peck Day Memorial Hospital	Gen	Corp	10	6	53	3	134
Manchester 76 834—Hill boro							
Manchester Isolation Hosp	Iso	City	67				100
Portsmouth 14 495—Rockingham							
Mark H Wentworth Home for Chronic Invalids	Inc	NP Assn	49			42	12
Tilton 1,712—Belknap							
New Hampshire Soldiers Home	Inst	State	25			7	38
West Stewartstown 350—Coos							
Coos County Hospital	Gen	County	40	5			
Woodsville 1 500—Grafton							
Grafton County Hospital	InstGen	County	30	4	7	27	152
Summary for New Hampshire							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	37	4 243	3 450	39 949			
	9	919	708	1 162			
Totals	46	5 162	4 158	41 111			
Refused registration	0						

## NEW JERSEY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassincts	Number of Births	Average Census	Admissions
Allentown 706—Monmouth							
Dr Farmers Private Hosp	Gen	Indiv	25	6	21	20	525
Allenwood 166—Monmouth							
Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis	TB	County	100			92	106
Atlantic City 66 198—Atlantic							
Atlantic City Hospital	Gen	NP Assn	231	45	916	189	6 571
Children's Seashore House at Atlantic City for Invalid Children	Orth	NP Assn	355			102	2 507
Bayonne 88 979—Hudson							
Bayonne Hospital and Dispensary	Gen	NP Assn	195	30	377	142	4 153
Swiney Sanatorium	Gen	Indiv	12	6	29	4	156
Beach Haven 715—Ocean							
Seashore Branch of Babies Hospital	Unit of Babies Hospital Philadelphia Pa						
Belle Mead 51—Somerset							
Belle Mead Sanatorium and Farm	N & M	Corp	65			38	107
Belleville 26 974—Essex							
Essex County Hospital for Contagious Diseases	I o	County	540			152	3 455
Bernardsville 3 336—Somerset							
Shannon Lodge	Gen	Corp	30			8	76
Bound Brook 7 372—Somerset							
Bound Brook Hospital	Gen	NP Assn	50	10	51	20	587
Bridgeton 15 659—Cumberland							
Bridgeton Hospital	Gen	NP Assn	89	16	258	52	1 569
Browns Mills 313—Burlington							
Deborah Sanatorium	TB	NP Assn	45			39	90
Camden 118 700—Camden							
Bellevue Hospital	Gen	Corp	20	10		Estab	1937
Cooper Hospital	Gen	NP Assn	315	60	1 448	290	8 705
Marion Childs Hospital for Children	Unit of West Jersey Homeopathic Hospital						
West Jersey Homeopathic Hospital	Gen	NP Assn	250	48	1 023	151	5 994
Cedar Grove 1 587—Essex							
Essex County Hospital	Ment	County	2 484			2,370	600
Dover 10 031—Morris							
Dover General Hospital	Gen	NP Assn	78	12	424	56	2,261
Dumont 2 861—Bergen							
Dumont Private Hospital	Gen	Indiv	10	4	25	4	154

Key to symbols and abbreviations is on page 986

NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
East Orange 68 020—Essex Homeopathic Hospital of Essex County*	Gen	NPAscn	95	25	603	90	3 310
Elizabeth 114 559—Union Mexican Brothers Hosp *	Gen	Church	165			106	2 101
Elizabeth General Hospital and Dispensary*	Gen	NPAscn	220	33	866	160	6 253
St Elizabeth Hospital	Gen	Church	206	44	557	167	3 024
Englewood 17 895—Bergen Englewood Hospital*	Gen	NPAscn	196	42	753	147	5 252
Ft Hancock—Monmouth Station Hospital	Gen	Army	50	2	15	19	846
Franklin 4 176—Sussex Franklin Hospital	Gen	NPAscn	26	6	65	13	575
Freehold 6 894—Monmouth Freehold Hospital	Gen	Indiv	25	6	25	5	174
Greuloch 255—Camden Camden County Gen Hosp	Gen	County	160			153	8 2
Camden County Hospital for Mental Diseases	Ment	County	750			700	175
Lakeland Sanatorium	TB	County	240			274	248
Gen Gardner 654—Hunterdon New Jersey State Sanat +	TB	State	494			406	406
Greystone Park—Morris New Jersey State Hosp +	Ment	State	5 250			5 169	1 637
Rated capacity 4 000							
Hackensack 24 568—Bergen Hackensack Hospital*	Gen	NPAscn	250	30	955	209	7 001
Hasbrouck Heights 5 638—Bergen Hasbrouck Heights Hosp	Gen	NPAscn	31	5	44	19	647
Hoboken 59 261—Hudson St Mary Hospital*	Gen	Church	430	30	402	209	5 782
Irrington General Hosp	Gen	City	79	17	305	60	2 113
Jersey City 316 715—Hudson Christ Hospital*	Gen	Church	181	25	565	179	4 639
Fairmount Hospital	Gen	NPAscn	70	12	167	30	1 100
Greenville Hospital	Gen	NPAscn	60	16	258	47	796
Jersey City Hospital**	Gen	City	900			786	18 221
Margaret Hague Maternity Hospital*	Mat	County	2 224	5 241		200	6 238
Psychopathic Hospital St Francis Hospital*	Gen	Unit of Jersey City Hospital	240	12	111	160	3 862
Kearny (Arlington P O) 40 716—Hudson West Hudson Hospital	Gen	NPAscn	63	20	224	47	2 411
Lakewood 5 000—Ocean Paul Kimball Hospital	Gen	NPAscn	65	10	123	35	1 275
Lakehurst 947—Ocean U S Naval Dispensary and Family Hospital	Gen	Fed	20	3	17	10	376
Long Branch 18 499—Monmouth Dr E C Hazard Hospital	Gen	NPAscn	95	30	224	70	1 962
Monmouth Memorial Hospital*	Gen	NPAscn	181	30	555	157	5 049
Lvone—Somerset Veterans Admin Facility	Ment	Let	895			920	237
Marlboro 500—Monmouth New Jersey State Hospital	Ment	State	2 150			2 044	650
Rated capacity 2 000							
Metuchen 5 745—Middlesex Roosevelt Hospital	TB	County	221			203	352
Midland Park 3 638—Bergen Christian Sanatorium	N&M	NPAscn	180			126	173
Millville 14 763—Cumberland Millville Hospital	Gen	NPAscn	37	6	161	33	1 363
Montclair 42 017—Essex Montclair Community Hosp	Gen	NPAscn	56	20	254	51	1 594
Mountainside Hospital**	Gen	NPAscn	330	50	663	225	6 166
St Vincent's Hospital	Gen	Church	46	12	194	32	1 156
Morristown 15 187—Morris All Souls Hospital*	Gen	Church	109	25	346	73	2 048
Morristown Memorial Hospital*	Gen	NPAscn	135	20	292	51	2 296
Shonghum Mountain Sanat	TB	County	62			51	51
Mt Holly 6 573—Burlington Burlington County Hospital*	Gen	NPAscn	123	18	426	94	2 827
Neptune 2 258—Monmouth Pitkin Memorial Hosp**	Gen	NPAscn	146	27	606	115	4 526
Newark 442 337—Essex Babies Hospital—Coit Memorial	Chil	NPAscn	60			40	1 069
Community Hospital (col) Hospital and Home for Crippled Children	Gen	NPAscn	35	3	15	26	372
Hospital of St Barnabas and for Women and Children*	Orth	NPAscn	110			76	357
Lincoln Hospital	Gen	Church	104	20	494	96	2 851
Newark Beth Israel Hospital*	Gen	Corp	45	12	120	14	697
Newark City Hospital**	Gen	NPAscn	375	70	1 664	317	11 705
Newark Eye and Ear Infirmary*	Gen	City	700	40	1 562	605	16 215
Newark Memorial Hosp**	ENT	NPAscn	69			35	2 551
Presbyterian Hospital*	Gen	NPAscn	131	30	456	86	2 952
St James Hospital*	Gen	NPAscn	214	53	918	172	6 185
St Michael's Hospital*	Gen	Church	107	18	507	87	3 026
New Brunswick 24 555—Middlesex Middlesex General Hosp*	Gen	NPAscn	200	17	225	196	5 775
St Peter's General Hosp**	Gen	NPAscn	90	20	316	65	2 392
New Lisbon 213—Burlington Fairview Sanatorium	Gen	Church	172	34	576	125	4 355
TB	County		120			105	105

NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Newton 5 401—Sussex Newton Memorial Hospital	Gen	NPAscn	43	8	135	30	844
Northfield 2 804—Atlantic Atlantic County Hospital for Mental Diseases	Ment	County	400			526	182
Atlantic County Hospital for Tuberculous Diseases	TB	County	50			43	65
Oceanport 1 872—Monmouth Station Hospital	Gen	Army	56			17	710
Orange 35 399—Essex New Jersey Orthopaedic Hospital and Dispensary*	Orth	NPAscn	36			50	3 32
Orange Memorial Hospital	Gen	NPAscn	325	75	1 104	221	7 941
St Mary's Hospital*	Gen	Church	115	35	465	77	2 595
Passaic 62 959—Passaic Beth Israel Hospital	Gen	NPAscn	67	14	263	41	1 339
Passaic General Hospital*	Gen	NPAscn	175	25	674	125	4 953
St Mary's Hospital*	Gen	Church	176	56	912	140	5 108
Pateron 138 513—Passaic Nathan and Miriam Barnert Memorial Hospital*	Gen	NPAscn	113	16	504	105	3 006
Pateron General Hospital*	Gen	NPAscn	271	49	819	212	6 745
St Joseph's Hospital*	Gen	Church	410	47	895	285	6 960
Valley View Sanatorium	TB	County	279			221	247
Perth Amboy 43 516—Middlesex Perth Amboy General Hospital*	Gen	NPAscn	160	18	510	150	4 803
Phillipsburg 19 255—Warren Warren Hospital	Gen	NPAscn	63	12	144	55	1 447
Plainfield 34 422—Union Mullenberg Hospital*	Gen	NPAscn	258	35	837	159	6 150
Point Pleasant 2 055—Ocean Point Pleasant Hospital	Gen	NPAscn	23	8	100	16	566
Princeton 6 992—Mercer Princeton Hospital	Gen	NPAscn	56	13	102	28	966
Rahway 16 011—Union Rahway Memorial Hospital	Gen	NPAscn	100	20	281	46	1 823
Red Bank 11 622—Monmouth Riverview Hospital	Gen	NPAscn	29	10	117	16	779
Ridgewood 12 188—Bergen Bergen Pines Bergen County Hospital	TB	County	420			295	705
Riverside 4 010—Burlington Zurbrugg Memorial Hosp	Gen	NPAscn	41	10	123	25	895
Salem 8 047—Salem Salem County Mem Hosp	Gen	NPAscn	36	4	245	55	1 102
Scotch Plains 1 010—Union Bonnie Burn Sanatorium	TB	County	400	3	4	859	431
Secaucus 8 950—Hudson Hudson County Contagious Disease Hospital	Is	County	200			55	874
Hudson County Hospital	Gen	County	232			253	551
Hudson County Hospital for Mental Diseases	Ment	County	1 582			1 506	556
Hudson County Tuberculosis Hospital and Sanat +	TB	County	210			210	251
Skillman 25—Somerset New Jersey State Village for Epileptics	Epil	State	1 555			1 533	150
Rated capacity 1 300							
Somers Point 2 053—Atlantic Atlantic Shores Hospital	Gen	Corp	65	9	84	20	714
Somerville 8 255—Somerset Somerset Hospital*	Gen	NPAscn	96	20	421	6	2 449
South Amboy 8 476—Middlesex South Amboy Mem Hosp	Gen	NPAscn	35	6	112	20	819
Summit 14 556—Union Fair Oaks Sanatorium	Nerv	Corp	42			29	163
Overlook Hospital*	Gen	NPAscn	119	21	387	84	2 555
Sussex 1 415—Sussex Alexander Linn Hospital	Gen	City	20	5	26	8	300
Teaneck 3 900—Bergen Holy Name Hospital*	Gen	Church	184	41	793	155	3 895
Trenton 15 556—Mercer Charles Private Hospital	Gen	Corp	50	10	46	31	555
Mercer Hospital*	Gen	NPAscn	210	37	702	154	4 555
New Jersey State Hospital	Ment	State	2 879			2 755	1 001
Rated capacity 2 800							
Orthopaedic Hospital and Dispensary	Orth	NPAscn	50			21	214
St Francis Hospital*	Gen	Church	255	30	657	174	5 555
Trenton Municipal Hospital	TB	City	333			241	49
William McKinley Memorial Hospital*	Gen	NPAscn	116	30	403	97	3 115
Union City 5 659—Hudson Union City General Hosp	Gen	NPAscn	30	15	55	5	555
Verona 7 101—Essex Essex Mountain Sanatorium	TB	County	450			406	51
Vineland 7 556—Cumberland Newcomb Hospital	Gen	Corp	87	15	255	45	1 222
Weehawken (Union City P O) 14 567—Hudson North Hudson Hospital*	Gen	NPAscn	171	20	217	105	3 555
Woodbury 8 175—Gloucester Brewer Hospital	Gen	Indiv	14	5	No data	27	1 555
Underwood Hospital	Gen	NPAscn	47	20	225	37	1 555
Wrightstown 176—Burlington Station Hospital	Gen	Army	70	1	2	51	1 555
Related Institutions							
Atlantic City 6 195—Atlantic Dr Leonard's Private Sanit	Drug	Indiv	27			4	4
Municipal Hospital	City		49			2	61

NEW JERSEY—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Bridgeton 10 699—Cumberland County Hospital for Insane	Ment	County	300			222	57
Browns Mills 313—Burlington Browns Mills Nursing Cottage	TB	Corp	58			47	44
Manor Nursing Cottage	TB	Indiv	40				20
Sycamore Hall Sanatorium	TB	Indiv	33				20
Burlington 10 44—Burlington Masonic Home	Inst	Frat	30			33	70
Caldwell 5 144—Essex Theresa Grotta Home for Convalescents	CardConv	NPA's'n	40			30	303
Camden 118 700—Camden Municipal Hospital for Contagious Diseases	Iso	City	100			19	320
Cranford 6 001—Union Brookside Hospital	Conv	Indiv	20			6	109
Farmingdale 629—Monmouth Tuberculosis Preventorium for Children	TB	NPA's'n	206				580
Haddonfield 8 857—Camden Bancroft School	McDe	NPA's'n	130			94	32
Jamesburg 2 048—Middlesex New Jersey State Home for Boys	Inst	State	24			11	1 000
Jersey City 316 715—Hudson Salvation Army Door of Hope Home and Hospital	Mat	Church	8	6	43	6	69
Longport 298—Atlantic Betty Bancharach Home for Afflicted Children	Orth	Frat	100			34	60
Menlo Park 305—Middlesex New Jersey Home for Disabled Soldiers	Inst	State	100			64	110
Morristown 15 197—Morris Aurora Institute	Conv	Corp	90			34	460
Newark 442 337—Essex Florence Crittenton Home	Mat	NPA's'n	27	30	30	17	39
Newark City Almshouse	Inst	City	96			90	200
Newark Convalescent Hosp	Conv	City	100			142	100
New Brunswick 34 555—Middlesex Rutgers Infirmary	Inst	NPA's'n	12			1	127
Newfoundland 564—Morris Idlelease Sanatorium	TB	Corp	50			31	59
New Lisbon 213—Burlington Burlington County Hospital for the Insane	Ment	County	258			266	61
State Colony for Feeble minded Males	McDe	State	626			773	97
		Rated capacity	600				
Northfield 2 804—Atlantic Atlantic County Hospital	Inst	County	120			79	40
Ocean Grove 3 000—Monmouth Methodist Episcopal Home for Aged	Inst	Church	10			12	37
Passaic 62 009—Passaic Passaic Municipal Hosp	TB Iso	City	20	2		2	61
Paterson 138 513—Passaic Paterson City Hospital	TB Iso	City	110			40	130
Princeton 6 092—Mercer Isabella McCosh Infirmary of Princeton University	Inst	NPA's'n	54			17	1 354
Rahway 16 011—Union New Jersey Reformatory Hospital	Inst	State	16			6	382
Roseland 10 08—Essex Mountain View Rest	N CM	Corp	20			20	116
Sea Isle City 8 00—Cape May Sea Isle Hospital and Training School	N CM	Corp	60			30	129
Totowa (Little Falls P O) 4 600—Passaic North Jersey Training School	McDe	State	624			507	76
		Rated capacity	620				
Trenton 123 306—Mercer New Jersey State Prison Hospital	Inst	State	42			26	703
State Home for Girls	Inst	State	50	3	34	29	493
Upper Montclair—Essex Montclair Sanitarium	Conv	Part	10			6	61
Vineland 7 506—Cumberland Maplehurst School	McDe	Indiv	18				6
New Jersey Memorial Home for Disabled Soldiers Sailors Marines and Their Wives and Widows	Inst	State	60			78	374
Training School at Vineland	McDe	NPA's'n	500			520	50
Vineland State School	McDe	State	1 469			1 476	99
		Rated capacity	1 300				
West Englewood 2 207—Bergen Englewood Sanitarium (Lynwood Lodge)	N CM	Corp	25			14	7
Woodbine 2 164—Cape May Woodbine Colony for Feeble minded Males	McDe	State	637			664	81
		Rated capacity	640				
Summary for New Jersey							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	42	6 743	5 609	8 305			
Totals	167	43 046	36 413	3 0191			
Refused registration	8	100					

NEW MEXICO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albuquerque 26 570—Bernalillo Albuquerque Indian Sanat	TB	IA	100			93	402
A T & S F Hospital	Indus	NPA's'n	67			26	418
Children's Home and Hosp	Orth	NPA's'n	30	10		15	289
Methodist Sanatorium and St Joseph Sanatorium and Hospital	TB	Church	60			50	103
Southwestern Presbyterian Sanatorium	G & TB	Church	196	12	297	118	2,092
U S Indian School Hosp	Gen	IA	120	12	263	92	1 789
Veterans Admin Facility	G & TB	Vet	71	8	39	51	1 308
Black Rock (Zuni P O)—McKinley Zuni Sanatorium	Gen	IA	209			229	1 645
Carlsbad 3 708—Eddy St Francis Hospital	Gen	Church	40	5	136	22	895
Clayton 2 518—Union St Joseph Hospital	Gen	Church	25	5	21	5	203
Clovis 8 021—Curry A T & S F Hospital	Indus	NPA's'n	32			20	302
Baptist Hospital	Gen	Church	19	4	45	13	666
Crownpoint 90—McKinley Eastern Navajo Hospital	Gen	IA	26	4	29	19	650
Dawson 2 662—Colfax Phelps Dodge Corporation Hospital	Gen	Corp	30	4	20	4	153
Denning 3 377—Luna Denning Ladies Hospital	Gen	NPA's'n	20	3	20	7	270
Dulce 44—Rio Arriba Jicarilla Hospital	Gen	IA	19	5	11	15	276
Farmington 1 300—San Juan Mercy General Hospital	Gen	Indiv	23	5	20	10	200
San Juan Episcopal Indian Mission Hospital	Gen	Church	16	1	9	7	218
San Juan Hospital	Gen	NPA's'n	18	4		6	890
Fort Bayard 1 000—Grant Veterans Admin Facility	G & TB	Vet	300			215	801
Fort Stanton 400—Lincoln U S Marine Hospital	TB	USPHS	270			179	186
Fort Wingate 14—McKinley Charles H Burke Hospital	Gen	IA	34	4	12	29	964
Gallup 5 992—McKinley St Mary's Hospital	Gen	Church	61	6	118	32	1 048
Gardiner 300—Colfax Gardiner Hospital	Indus	NPA's'n	45			12	97
Holy Cross—Luna Holy Cross Sanatorium	TB	Church	180			40	59
Hot Springs 1 336—Sierra Carrie Tingley Hospital for Crippled Children	Orth	State	120			Instab	1937
Virginia Ann Clinic and Hospital	Gen	Indiv	18	4	14	15	560
Las Vegas 4 710—San Miguel Las Vegas Hospital (Car-penter Memorial)	Gen	NPA's'n	20	4	53	12	67
New Mexico State Hospital	Ment	State	776			760	206
		Rated capacity	700				
St Anthony's Hospital	Gen	Orth	48	6	43	30	603
Mescalero 300—Otero Mescalero Apache Indian Hospital	Gen	IA	31	4	22	20	777
Raton 6 090—Colfax New Mexico Miners Hospital	Cen	State	76	5	06	11	511
Rehoboth 100—McKinley Rehoboth Mission Hospital	Gen	Church	30	10	100	20	600
Roswell 11 173—Chaves St Mary's Hospital	Gen	Church	60	8	174	24	1 048
Santa Fe 11 176—Santa Fe St Vincent's Sanatorium and Hospital	G & TB	Church	97	10	113	48	1 128
U S Indian Hospital (Chas F Lummi's Hospital)	Cen	IA	82	4	24	32	968
Shiprock 120—San Juan Northern Navajo Hospital	Gen	IA	44	4	50	45	1 232
Silver City 3 519—Grant Grant County Hospital	Gen	NPA's'n	20	5	43	12	645
Socorro 2 000—Socorro Socorro Infirmary	TB	State	60			64	105
Toadlena 49—San Juan Toadlena Hospital	Gen	IA	20	2		8	201
Tucumcari 4 143—Quay Tucumcari General Hospital	Cen	Indiv	00	6	106	30	1 095
Valmora 125—Mora Valmora Sanatorium	TB	NPA's'n	70	1	3	40	124
Related Institutions							
Dixon 800—Rio Arriba Brooklyn Cottage Hospital	Cen	Church	10	6	86	7	415
Dulce 44—Rio Arriba Jicarilla Indian Sanatorium	TB	Chil IA	50			46	62
Eunice 100—Lea Eunice Hospital	Cen	Indiv	10	2	30	4	161
Hobbs 508—Lea Hobbs General Hospital	Cen	Indiv	22	4	111	13	873
Lordsburg 2 069—Hidalgo Lordsburg Hospital	Cen	Corp	20	3	27	5	241
Los Lunas 513—Valencia New Mexico Home and Training School for Mental Defectives	McDe	State	80			72	1
		Rated capacity	70				
Portales 2 519—Roosevelt Brasell Hospital	Gen	Indiv	10	2	53	2	100
Santa Fe 11 176—Santa Fe New Mexico Penitentiary Hospital	Inst	State	05			7	103

Key to symbols and abbreviations is on page 986



## NEW MEXICO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Springer 957—Collfax	Gen	Indiv	10	3	15	2	70
Springer Hospital	Gen	Indiv	10	3	15	2	70
Taos 122—Taos	Gen	IA	16	3	2	7	115
Thomas P. Martin Hosp	Gen	IA	20	3	24	17	564
Tohatchi 2104—McKinley	Gen	IA	20	3	24	17	564
Tohatchi General Hospital	Gen	IA	20	3	24	17	564
Summary for New Mexico							
Hospitals and sanatoriums	43	Beds	3 745	Average Census	2 571	Admissions	27 859
Related Institutions	11	Beds	311	Average Census	182	Admissions	3 050
Totals	54	Beds	4 056	Average Census	2 753	Admissions	30 909
Refused registration	3	Beds	56	Average Census		Admissions	

## NEW YORK

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Albany 127 412—Albany	Gen	NPA'sn	70	40	846	47.0	11 561
Albany Hospital**	Gen	NPA'sn	70	40	846	47.0	11 561
Anthony N. Brady Mater	Mat	Church	54	60	1 190	45	1 334
nity Home	Mat	Church	54	60	1 190	45	1 334
Child's Hospital	Chil	Church	60			47	484
Memorial Hospital*	Gen	NPA'sn	120	16	210	10.2	2 084
St Peter's Hospital*	Gen	Church	105		3	124	3 383
Albion 4878—Orleans	Gen	NPA'sn	24	11	8.0	14	447
Arnold Gregory Memorial	Gen	NPA'sn	24	11	8.0	14	447
Hospital	Gen	NPA'sn	24	11	8.0	14	447
Amityville 4 437—Suffolk	Gen	Corp	100	16	196	32	1 137
Brunswick General Hospital	Gen	Corp	100	16	196	32	1 137
Long Island Home	N&M	Corp	206			1.3	237
Louden Knickerbocker Hall	N&M	Part	175			186	242
Reed General Hospital	Gen	Indiv	17	3	14	13	340
Amsterdam 34 817—Montgomery	Gen	NPA'sn	75	15	198	55	1 480
Amsterdam City Hospital*	Gen	NPA'sn	75	15	198	55	1 480
Montgomery Sanatorium	TB	County	72			77	186
St Mary's Hospital*	Gen	Church	100	22	261	6.0	1 874
Auburn, 36 62—Cayuga	Gen	NPA'sn	133	22	402	119	4 073
Auburn City Hospital*	Gen	NPA'sn	133	22	402	119	4 073
Mercy Hospital	Gen	Church	80	14	169	36	1 242
Ballston Spa 4 591—Saratoga	Gen	NPA'sn	16	6	56	8	259
Benedict Memorial Hospital	Gen	NPA'sn	16	6	56	8	259
Batavia 17 370—Genesee	Gen	NPA'sn	71	11	227	43	1 547
Batavia Hospital	Gen	NPA'sn	71	11	227	43	1 547
St Jerome's Hospital	Gen	Church	58	14	256	44	1 557
Veterans Admin Facility	Vet		207			250	2 174
Bath 4 015—Steuben	Gen	NPA'sn	52	8	111	50	1 488
Bath Memorial Hospital	Gen	NPA'sn	52	8	111	50	1 488
Pleasant Valley Sanatorium	TB	County	59			53	47
Veterans Admin Facility	Vet		390			372	1 770
Bay Shore 4 060—Suffolk	Gen	Indiv	28	8	74	17	774
Dr King's Hospital	Gen	NPA'sn	82	24	372	61	2 020
Southside Hospital	Gen	NPA'sn	82	24	372	61	2 020
Beacon 11 933—Dutchess	N&M	Corp	77			57	62
Craig House	Corp	Corp	45	10	92	20	780
Highland Hospital	Ment	State	1 419			1 382	172
Matteawan State Hospital	Ment	State	1 419			1 382	172
Bedford Hills 1 000—Westchester	TB	NPA'sn	230			227	263
Montefiore Hospital Country	TB	NPA'sn	230			227	263
Sanatorium*	TB	NPA'sn	230			227	263
Binghamton 76 662—Broome	Gen	City	460	40	878	322	8 395
Binghamton City Hosp**	Gen	City	460	40	878	322	8 395
Binghamton State Hosp**	Ment	State	2 736			3 037	583
Our Lady of Lourdes Me	Gen	Church	70	22	211	42	1 900
morial Hospital	Gen	Church	70	22	211	42	1 900
Brentwood 334—Suffolk	Ment	State	7 000			7 619	1 987
Pilgrim State Hospital	Ment	State	7 000			7 619	1 987
Ross Sanitarium	Gen	Indiv	30	2	7	18	177
Bronxville 6 387—Westchester	Gen	Corp	66	20	267	58	1 044
Lawrence Hospital	Gen	Corp	66	20	267	58	1 044
Brooklyn 2 500 401—Kings	Gen	Indiv	50	16	240	50	1 550
Adelphi Hospital	Gen	Corp	73	20	470	48	1 936
Bay Ridge Hospital	Gen	Corp	73	20	470	48	1 936
Bensonhurst Maternity	Mat	Corp	24	26	402	12	421
Hospital	Mat	Corp	24	26	402	12	421
Bethany Deaconess Hosp	Gen	Church	84	20	307	47	1 460
Beth El Hospital*	Gen	NPA'sn	190	30	758	191	6 768
Beth Moses Hospital*	Gen	NPA'sn	194	30	739	163	5 012
Boro Park General Hospital	Gen	Indiv	83	30	651	30	1 637
Brooklyn Cancer Institute*	Unit of Kings County Hospital						
Brooklyn Eye and Ear Hos	ENT	NPA'sn	143			23	8 662
pital*	ENT	NPA'sn	143			23	8 662
Brooklyn Home for Con	TB	NPA'sn	120			113	120
sumtives	TB	NPA'sn	120			113	120
Brooklyn Hospital*	Gen	NPA'sn	366	44	1 050	276	8 206
Brooklyn State Hospital*	Ment	State	2 067			2 066	1 973
Brooklyn Womens Hosp	MatGyn	NPA'sn	50	44	1 056	37	1 412
Bushwick Hospital*	Gen	NPA'sn	107	26	553	30	1 101
Caledonian Hospital*	Gen	NPA'sn	100	30	326	59	2 134
Carson C. Peck Memorial	Gen	NPA'sn	62	23	718	62	2 231
Hospital	Gen	NPA'sn	62	23	718	62	2 231
Coney Island Hospital**	Gen	Corp	115	28	716	117	3 488
Crown Heights Hospital	Gen	Corp	115	28	716	117	3 488
Cumberland Hospital**	Gen	Corp	254	24	900	260	8 220
Evangelical Deaconess Hosp	Gen	Church	100	20	300	50	1 500

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Greenpoint Hospital*	Gen	City	288	32	1 112	204	1 009
Harbor Hospital	Gen	NPA'sn	53	11	64	28	911
Hospital of the Holy Family	Gen	Church	63			60	1 438
House of St Giles the Cripple	Orth	Church	39				
Israel Zion Hospital*	Gen	NPA'sn	300	100	3 204	301	9 063
Jewish Hospital**	Gen	NPA'sn	540	120	2 450	456	1 181
Kings County Hospital**	Gen	City	2 700	120	2 733	2 925	9 334
Kingston Avenue Hosp**	Gen	City	510			285	3 633
Kingsway Hospital	Gen	Indiv	22	10	101	10	279
Liberty Hospital	Gen	Indiv	40	24	300	10	600
Long Island College Hospital**	Gen	NPA'sn	420	47	1 208	307	9 145
Lutheran Hospital	Gen	Church	90	22	619	53	919
Madison Park Hospital	Gen	Corp	74	26	1 034	60	1 181
Methodist Episcopal Hospital**	Gen	Church	400	80	1 692	344	9 931
Midwood Hospital	Gen	Corp	53	27	417	30	1 461
Norwegian Lutheran Deaconesses Home and Hospital**	Gen	Church	163	38	751	161	4 901
Prospect Heights Hospital*	Gen	NPA'sn	136	39	551	50	2 194
Riverdale Hospital	Gen	Corp	40	36	811	11	449
St Catherine's Hospital**	Gen	Church	260	53	1 166	212	5 907
St Cecilia Hospital for Women	Mat	Church	66	50	600	24	1 000
St Charles Hospital Orthopedic Clinic	Orth	Church	50			50	177
St John's Hospital**	Gen	Church	304	30	632	177	4 730
St Mary's Hospital**	Gen	Church	250	56	1 170	185	4 817
St Peter's Hospital*	Gen	Church	202	24	342	132	3 903
Samaritan Hospital	Gen	Church	81	10	378	37	1 366
Shore Road Hospital	Gen	Corp	49	15			
Station Hospital	Gen	Army	50			50	100
Swedish Hospital	Gen	NPA'sn	64	16	237	51	1 000
Trinity Hospital*	Gen	NPA'sn	110	15	100	100	2 528
U. S. Naval Hospital*	Gen	Navy	484				
Unity Hospital	Gen	NPA'sn	209	39	811	196	4 438
Victory Memorial Hospital	Gen	NPA'sn	56	16	447	58	1 571
Wade Hospital	Gen	Indiv	40	14	28	10	211
Williamsburgh Maternity Hospital	Mat	Indiv	60	50	937	20	1 000
Wyckoff Heights Hospital**	Gen	NPA'sn	170	30	600	100	3 310
Buffalo 573 076—Erie	Gen	City	1 020	38	572	82	10 532
Buffalo City Hospital**	Gen	NPA'sn	120	16	184	60	2 320
Buffalo Columbus Hospital	Gen	NPA'sn	437	28	605	37	10 600
Buffalo General Hospital**	Gen	Church	191	20	416	146	3 002
Buffalo Hospital of the Sisters of Charity*	Gen	Church	191	20	416	146	3 002
Buffalo State Hospital*	Ment	State	2 040			2 037	3 100
Central Park Hospital	Gen	NPA'sn	63	15	273	40	2 304
Children's Hospital*	Mat&Ch	NPA'sn	210	40	771	165	7 014
Deaconess Hospital**	Gen	NPA'sn	190	30	983	158	6 001
Emergency Hospital of the Sisters of Charity	Gen	Church	106			95	2 562
Lafayette General Hospital	Gen	NPA'sn	60	13	253	47	1 913
Memorial Hospital	Gen	NPA'sn	50	10	196	30	977
Mercy Hospital*	Gen	Church	164	34	820	172	3 900
Millard Fillmore Hospital**	Gen	NPA'sn	230	93	1 376	177	6 406
Providence Retreat	N&M	Church	200			111	500
St Mary's Infant Asylum and Maternity Hospital	Vat	Church	46	46	678	20	47
State Institute for the Study of Malignant Disease	St. Ca	State	30			25	1 449
U. S. Marine Hospital	Gen	USPHS	70			51	1 141
Callicoon 506—Sullivan	Gen	Indiv	12	4	57	7	211
Callicoon Hospital	Gen	Indiv	12	4	57	7	211
Cambridge 1 762—Washington	Gen	NPA'sn	97	10	77	73	1 106
Mary McClellan Hospital*	Gen	NPA'sn	97	10	77	73	1 106
Canandaigua 7 541—Ontario	Gen	NPA'sn	57	10	77	73	1 106
Brigham Hall Hospital	N&M	Corp	70			55	93
Frederick Ferris Thompson Hospital	Gen	Corp	101	17	269	82	1 600
Veterans Admin Facility	Ment	Vet	1 110			574	909
Canastota 4 230—Madison	Gen	City	22	6			
Canastota Memorial Hospital	Gen	City	22	6			
Caesadaga 400—Chautauque	Gen	County	180			111	394
Newton Memorial Hospital	TB	County	180			111	394
Castle Point 23—Dutchess	TB	Vet	479			444	600
Veterans Admin Facility	TB	Vet	479			444	600
Catskill 5 682—Greene	Gen	County	50	12	136	57	1 110
Memorial Hospital of Greene County	Gen	County	50	12	136	57	1 110
Central Islip 675—Suffolk	Ment	State	6 110			6 708	1 100
Central Islip State Hospital**	Ment	State	6 110			6 708	1 100
Central Valley 8 000—Orange	N&M	Corp	40			90	7
Falkirk in the Ramapo	N&M	Corp	40			90	7
Chenango Bridge 760—Broome	TB	County	318			60	51
Broome County Tuberculosis Hospital	TB	County	318			60	51
Clifton Springs 1 810—Ontario	Gen	NPA'sn	474	10	70	10	1 100
Clifton Springs Sanitarium	Gen	NPA'sn	474	10	70	10	1 100
Clinton and Clinch	Gen	NPA'sn	50	10	140	4	1 100
Coehoes 23 226—Albany	Gen	NPA'sn	50	10	140	4	1 100
Coehoes Hospital*	Gen	NPA'sn	50	10	140	4	1 100
Old Spring 1 754—Putnam	Gen	NPA'sn	20	6	50	11	471
Julia J. Butterfield Memorial Hospital	Gen	NPA'sn	20	6	50	11	471
Cooperstown 2 000—Otsego	Gen	NPA'sn	50	10	142	4	1 100
Henry Imogene Bassett Hospital*	Gen	NPA'sn	50	10	142	4	1 100
Coopers 15 100—Steuben	Gen	NPA'sn	50	10	142	4	1 100
Coopers Hospital	Gen	NPA'sn	50	10	142	4	1 100

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Cornwall 1910—Orange Cornwall Hospital	Gen	NPA'ssn	61	11	257	44	1 410
Cortland 15 043—Cortland Cortland County Hospital	Gen	NPA'ssn	119	21	409	85	2 995
Cuba 1 422—Allegany Cuba Memorial Hospital	Gen	NPA'ssn	14	6	55	8	407
Dannemora 3 348—Clinton Dannemora State Hospital	Ment	State	851			945	110
		Rated capacity	816				
Danville 4 928—Livingston Danville General Hospital	Cen	NPA'ssn	22	4	78	20	466
Delhi 1 840—Delaware Delaware County Tubercu- losis Sanatorium	TB	County	32			18	30
Dobbs Ferry 5 741—Westchester Dobbs Ferry Hospital	Cen	NPA'ssn	41	10	101	21	746
Dunkirk 17 802—Chautauqua Brooks Memorial Hospital	Gen	NPA'ssn	50	10	191	34	1 147
Elizabethtown 686—Essex Community House Hospital	Cen	NPA'ssn	13	5	22	4	76
Ellenville 3 900—Ulster Veterans Memorial Hospital	Gen	NPA'ssn	14	5	67	10	294
Elmira 47 397—Chemung Arnot Ogden Memorial Hos- pital	Cen	NPA'ssn	185	30	539	139	5 263
Chemung County Sanat	TB	County	36			33	40
St Joseph's Hospital	Gen	Church	189	27	515	144	3 640
Endicott 16 231—Broome Ideal Hospital	Cen	City	116	30	523	88	2 693
Farmingdale 3 373—Nassau Nassau County Sanatorium	TB	County	416			354	463
Far Rockaway—Queens St Joseph Hospital	Cen	Church	114	20	368	78	3 002
Fillmore 488—Allegany Genesee County Memorial Hospital	Cen	NPA'ssn	16	4	56	4	263
Fishers Island 324—Suffolk Station Hospital	Cen	Army	66			47	754
Flushing—Queens Flushing Hospital and Dis- pensary	Cen	NPA'ssn	191	78	1 303	179	6 402
Parsons Hospital	Gen	Corp	40	12	178	37	1 546
Physicians Hospital	Gen	Corp	70	24	662	52	2 240
Station Hospital	Cen	Army	83			47	895
Ft Niagara (Youngstown P O)—Niagara Station Hospital	Gen	Army	40				
Ft Slocum—Westchester Station Hospital	Gen	Army	125			67	1 635
Ft Wadsworth (Staten Island P O)—Richmond Station Hospital	Cen	Army	27			7	393
Fulton 12 462—Otsego Albert Lindley Lee Memo- rial Hospital	Cen	City	36	11	246	23	1 930
Gabriels 200—Franklin Sanatorium Gabriels	TB	Church	125			58	55
Geneva 16 053—Ontario Geneva General Hospital	Cen	NPA'ssn	76	20	266	38	1 600
Glen Cove 11 420—Nassau North Country Community Hospital	Cen	NPA'ssn	100	20	383	76	2 601
Glen's Falls 18 531—Warren Glen's Falls Hospital	Cen	NPA'ssn	80	15	380	82	2 727
Westmount Sanatorium	TB	County	52			51	32
Gloversville 25 099—Fulton Nathan Littauer Hospital	Gen	NPA'ssn	102	18	264	62	2 491
Goshen 2 891—Orange Goshen Hospital	Cen	NPA'ssn	40	12	152	25	872
Interpines	N&M	Indiv	65			37	75
Gouverneur 4 015—St Lawrence Stephen B Van Duzee Hosp	Gen	NPA'ssn	19	7	96	12	519
Governors Island—New York Station Hospital	Gen	Army	170	9	90	146	2 883
Gowanda 3 042—Cattaraugus Townsend Hospital	Gen	NPA'ssn	22	8	112	8	438
Granville 3 483—Washington Emma Loring Stevens Hosp	Gen	NPA'ssn	16	6	61	8	361
Greenport 3 062—Suffolk Eastern Long Island Hosp	Gen	NPA'ssn	28	8	134	16	671
Harrison 1 485—Westchester St Vincent's Retreat	N&M	Church	200			176	106
Hastings-on-Hudson 7 097—Westchester Hastings Hillside Hospital	N&M	NPA'ssn	41			39	102
Helmuth—Erie Gowanda State Homeopathic Hospital	Ment	State	2 094			2 401	491
		Rated capacity	2 225				
Hempstead 12 650—Nassau Meadowbrook Hospital	Gen	County	250	18	405	198	5 059
Mersey Hospital	Cen	Church	15	11	273	15	601
Station Hospital	Gen	Army	35			15	579
Herkimer 10 446—Herkimer Herkimer Memorial Hosp	Gen	NPA'ssn	31	9	123	29	938
Holcomb 294—Ontario Oak Mount Sanatorium	TB	County	45			25	31
Holtville 260—Suffolk Suffolk Sanatorium	TB	County	162			153	161
Hornell 16 950—Steuben Bethesda Hospital	Gen	Corp	44	10	137	26	1 036
St James Mercy Hospital	Gen	Church	93	16	315	49	2 328
Hud on 12 337—Columbia Hudson City Hospital	Gen	Corp	103	15	253	76	3 052
Huntington 6 996—Suffolk Huntington Hospital	Gen	NPA'ssn	75	12	216	57	1 873
Ilion 9 950—Herkimer Ilion Hospital	Gen	NPA'ssn	25	6	113	19	701

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Irrington 3 067—Westchester Irrington House	Chil	Card	NPA'ssn	110		108	127
Ithaca 20 705—Tompkins Hermann M Biggs Memo- rial Hospital	TB	State	250			76	214
Tompkins County Memorial Hospital	Gen	NPA'ssn	102	23	401	84	2 798
Jamaica—Queens Jamaica Hospital	Gen	NPA'ssn	160	37	788	143	4 385
Mary Immaculate Hosp	Gen	Church	260	60	1 494	212	8 197
Memorial Hospital	Gen	Indiv	41	12	131	16	435
Queens General Hospital	Gen	City	644	52	1 465	577	13 426
Van Wyck Hospital	Gen	Indiv	75	15	73	25	583
Jamestown 45 155—Chautauqua Jamestown General Hosp	Gen	City	100	15	438	67	3 582
Woman's Christian Associa- tion Hospital	Gen	NPA'ssn	97	29	466	76	2 995
Johnson City 13 567—Broome Charles S Wilson Memorial Hospital	Gen	NPA'ssn	318	32	611	255	5 663
Katona 1 400—Westchester Four Winds	N&M	Indiv	35			29	45
Hillbourne Farms	N&M	NPA'ssn	15			6	18
Pinewood Sanitarium	N&M	Indiv	45			30	113
Kings Park 1 067—Suffolk Kings Park State Hosp	Ment	State	5 518			5 416	1 550
		Rated capacity	5 125				
Kingston 28 088—Ulster Benedictine Hospital (Our Lady of Victory Sanit)	Gen	Church	84	16	253	64	1 791
Kingston Hospital	Gen	NPA'ssn	118	15	345	72	3 082
Dr C O Sahler Sanit	Nerv	Dr Corp	100			41	84
Ulster County Tuberculosis Hospital	TB	County	56			52	75
Lackawanna 23 948—Erie Moses Taylor Hospital	Indus	NPA'ssn	25			12	287
Our Lady of Victory Hos- pital	Gen	Church	134	26	453	101	2 464
Lake Kushaqua 10—Franklin Stony Wold Sanatorium	TB	NPA'ssn	145			124	97
Lake Placid 2 930—Essex Lake Placid General Hosp	Gen	City	22	6	41	10	359
Liberty 3 427—Sullivan Maimonides Hospital	Gen	Frat	31	5		52	172
Workmen's Circle Sanat	TB	Frat	100				
Little Falls 11 105—Herkimer Little Falls Hospital	Gen	NPA'ssn	38	10	149	32	1 137
Livingston 249—Columbia Potts Memorial Hospital	TB	NPA'ssn	55			52	25
Lockport 23 160—Niagara Lockport City Hospital	Gen	City	72	14	348	68	2 085
Niagara County Sanatorium	TB	County	200			177	144
Long Beach 5 817—Nassau Long Beach Hospital	Gen	NPA'ssn	35	7	70	25	925
Long Island City—Queens Astoria Sanatorium	Gen	Corp	30	22	392	16	772
Boulevard Hospital	Gen	Corp	77	29	640	49	2 225
River Crest Sanitarium	N&M	Corp	132			104	304
St John's Long Island City Hospital	Gen	Church	253	47	933	166	6 893
Loomis 200—Sullivan Loomis Sanatorium	TB	NPA'ssn	118			82	155
Lowville 3 424—Lewis Lewis County General Hosp	Gen	StateCo	40	9	160	25	963
Lyons 3 956—Wayne Edward J Barber Hospital	Gen	Indiv	22	3	30	12	340
Lyons Hospital	Gen	Corp	21	6	94	14	485
Malone 8 657—Franklin Alice Hyde Memorial Hosp	Gen	NPA'ssn	74	12	132	55	1 087
Marcy 112—Oneida Marcy State Hospital	Ment	State	2 352			2 620	629
		Rated capacity	2 140				
Medina 6 071—Orleans Medina Memorial Hospital	Gen	NPA'ssn	32	7	97	15	640
Middle Grove 250—Saratoga Saratoga County Tubercu- losis Hospital	TB	County	100			43	47
Middletown 21 276—Orange Elizabeth A Horton Memo- rial Hospital	Gen	NPA'ssn	90	18	219	58	1 943
Middletown Sanitarium and Hospital	Gen	Indiv	45	8	No data supplied		
Middletown State Homeo- pathic Hospital	Ment	State	3 224			3 293	491
		Rated capacity	2 750				
Mineola 8 155—Nassau Nassau Hospital	Gen	NPA'ssn	170	50	686	143	4 906
Monticello 3 450—Sullivan Hamilton Avenue Hospital	Gen	Indiv	16	4	62	9	412
Monticello Hospital	Gen	NPA'ssn	26	4	61	12	605
Mt Kisco 5 127—Westchester Northern Westchester Hosp	Gen	NPA'ssn	100	18	323	73	2 847
Mt McGregor—Saratoga Metropolitan Life Insurance Company Sanatorium	G&TB	NPA'ssn	250			186	339
Mt Morris 3 238—Livingston Mt Morris Tuberculosis Hosp	TB	State	250			132	238
Mt Vernon 61 499—Westchester Mt Vernon Hospital	Gen	NPA'ssn	146	25	777	117	4 905
Mt Vernon 258—Otsego Otsego County Sanatorium	TB	County	26			18	32
Newburgh 31 275—Orange Estelle and Walter C Odell Memorial Sanatorium for Tuberculosis	TB	County	50			49	54
St Luke's Hospital	Gen	NPA'ssn	192	19	534	99	3 471

Key to symbols and abbreviations is on page 986

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
New Rochelle 31 000—Westchester	Gen	NP Assn	121	26	583	187	4 879
New Rochelle Hospital**	Gen	NP Assn	162		110	3 082	
New York City 4 211 699—New York	Gen	NP Assn	100		61	2 110	
Babies Hospital**	Chil	NP Assn	162		110	3 082	
Beekman Street Hospital*	Gen	NP Assn	100		61	2 110	
Bellevue Hospital**	Gen	City	2 326	105	1,303	2 290	9 028
Beth David Hospital*	Gen	NP Assn	160	40	200	110	2 101
Beth Israel Hospital**	Gen	NP Assn	363	80	1 760	260	7 790
Black S Sanatorium	Gen	Corp	189	36	115	8	3 347
Broad Street Hospital	Gen	NP Assn	117	8	63	44	2,087
Bronx Eye and Ear Infirmary	ENT	NP Assn	33			14	2 802
Bronx Hospital**	Gen	NP Assn	300	99	2 907	313	11 029
Bronx Maternity and Women's Hospital	Mat	NP Assn	34	36	624	17	720
Central and Neurological Hospital*	Neur	City	40			425	896
Charles B Towns Hospital	Drug	Corp	50			17	660
Columbus Hospital*	Gen	Church	260	40	581	100	3 126
Columbus Hospital Extension	Gen	Church	88	10	221	67	1 710
Community Hospital	Cen	NP Assn	80	10	126	37	1 084
Concourse Hospital	Cen	Indiv	38	30	38	26	1 976
Crotona Park Sanatorium	Corp	Corp	27	24	774	16	898
Doctors Hospital	Cen	NP Assn	270	50	614	134	3 791
Fitch Sanatorium	Gen	Corp	77	46	No data supplied		
Flower Fifth Avenue Hosp **	Gen	NP Assn	301	63	1 088	246	8 300
Fordham Hospital**	Cen	City	308	51	1 364	309	10 107
Franklin Maternity Sanit	Mat	Indiv	10	10	120	4	140
French Hospital*	Gen	NP Assn	200	0	674	182	4 290
Gouverneur Hospital*	Gen	City	192	20	281	161	3 760
Harlem Eye and Ear Hosp	ENT	NP Assn	50			10	1 867
Harlem Hospital**	Gen	City	543	99	1 710	500	10 890
Herman Knapp Memorial Eye Hospital*	Eye	NP Assn	50			32	819
Hosp for Joint Diseases**	G&O	NP Assn	300			310	5 392
Hunts Point Hospital	Gen	Corp	90	27	701	40	2 168
Jewish Maternity Hospital	Unit of Beth Israel Hospital						
Jew H Memorial Hospital	Gen	NP Assn	173	36	New building		
Knickerbocker Hospital*	Gen	NP Assn	174	30	672	120	4 431
Lebanon Hospital**	Gen	NP Assn	139	10	192	87	2 660
Dr Left's Maternity Hosp	Mat	Indiv	50	60	615	16	620
Lenox Hill Hospital**	Gen	NP Assn	300	68	1 070	422	11 347
Le Roy Sanatorium	Gen	Corp	54	14	114	31	1 143
Lincoln Hospital**	Gen	City	331	7	1 707	390	10 000
Lutheran Hospital	Gen	NP Assn	120	24	508	81	2 976
Iying in Hospital*	Unit of New York Hospital						
Manhattan Eye Ear and Throat Hospital*	ENT	NP Assn	212			144	17 132
Manhattan General Hosp	Gen	Corp	203	20	208	123	4 008
Manhattan Maternity and Dispensary	Unit of New York Hospital						
Manhattan State Hospital	Ment State	City	3 314			3 002	2 045
Memorial Hospital for the Treatment of Cancer and Allied Diseases*	Ca	NP Assn	112			99	2 702
Metropolitan Hospital**	Gen	City	1 365	40	815	1,273	10 447
Midtown Hospital	Gen	NP Assn	60	10	30	40	3 062
Miscericordia Hospital**	Gen	Church	246	67	1 316	200	5 011
Montefiore Hospital for Chronic Diseases**	Gen	NP Assn	712			689	1 770
Morrisania City Hospital**	Gen	City	471	68	1 206	440	13 711
Mt Eden Hospital	Gen	Indiv	40	30	601	32	2 074
Mt Morris Park Hospital	Gen	Indiv	44	30	100	20	663
Mt Sinai Hospital**	Gen	NP Assn	87			627	15 740
Murray Hill Hospital	Gen	Corp	73	6	42	37	1 698
Nazareth Hospital for Women and Children	TB	Church	200			248	363
Neurological Institute of New York**	Neur	NP Assn	222			167	3 694
New York City Cancer Institute Hospital*	Ca	City	192			109	894
New York City Hospital**	Gen	City	1,000	30	463	846	7 839
New York Eye and Ear Infirmary*	ENT	NP Assn	100			106	6 120
New York Foundling Hospital**	MatCh	Church	309	48	817	237	3 020
New York Hospital**	Gen	NP Assn	911	142	2,723	774	18 567
New York Infirmary for Women and Children*	Gen	NP Assn	125	37	933	88	3 715
New York Nursery and Childs Hospital	Unit of New York Hospital						
New York Ophthalmic Hosp	Unit of Flower Fifth Avenue Hospital						
New York Orthopaedic Dispensary and Hospital*	Orth	NP Assn	132			111	1 410
New York Polytechnic Medical School and Hospital**	Gen	NP Assn	329	30	870	205	8 951
New York Post Graduate Medical School and Hosp **	Gen	NP Assn	410			293	9 004
New York Society for the Relief of the Ruptured and Crippled*	Orth	NP Assn	200			168	3 602
New York State Psychiatric Institute and Hospital*	Ment State	State	142			158	226
Park East Hospital	Gen	Corp	124	24	6	67	2 057
Parkway Hospital	Gen	Corp	70	10	215	21	1 070
Park West Hospital	Gen	Corp	64	10	184	37	2 237
Payne Whitney Psychiatric Clinic	Unit of New York Hospital						
Peoples Hospital	Gen	NP Assn	53	5			New building
Presbyterian Hospital and Sloan Hospital for Women**	Gen	NP Assn	603	144	2 408	740	19 576

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Psychiatric Pavilion of Bellevue Hospital	Unit of Bellevue Hospital						
Reconstruction Hospital	Unit of New York Post Graduate Medical School and Hospital						
Research Division for Chronic Diseases	Chr	City	50			31	80
Rikers Island Hospital	Gen	City	208			170	3 000
Riverside Hospital	Tbiso	City	332			344	1 400
Roosvelt Hospital**	Gen	NP Assn	391			202	4 490
Royal Hospital	Gen	Indiv	110	42	1 108	100	3 400
St Ann's Maternity Hosp	Unit of New York Foundling Hospital						
St Clare's Hospital	Gen	Church	80	20	390	60	2 000
St Elizabeth's Hospital	Gen	Church	110	27	404	69	2 116
St Francis Hospital*	Gen	Church	300			240	5 690
St John's Hospital	Unit of New York Foundling Hospital						
St Joseph's Hospital for Consumptives	TB	Church	300			292	4 400
St Luke's Hospital**	Gen	Church	470			300	7 900
St Vincent's Hospital**	Gen	Church	400	30	791	364	10 110
Seton Hospital	TB	Church	200			202	4 400
Sloan Hosp for Women**	See Presbyterian Hospital						
Sydenham Hospital*	Gen	NP Assn	200	24	711	106	4 666
Union Hospital	Gen	NP Assn	45	20	213	56	1 700
U S Marine Hospital*	Gen	USPHS	400			308	1 018
University Heights Hospital	Gen	Corp	50	17	420	42	1 600
Veterans Admin Facility	Gen	Vet	900			850	4 461
Webb Sanatorium	Gen	Corp	19	12	138	13	600
Westchester Square Hosp	Gen	Corp	70	52	608	44	2 700
West Hill Sanatorium	N&M	Indiv	50			52	100
Wickham Hospital	Gen	Corp	60	9	166	40	1 800
Willard Parker Hospital**	Tbiso	City	424			204	5 600
William Booth Memorial Hospital	Gen	Church	48	24	203	27	840
Woman's Hospital*	GynOb	NP Assn	212	88	1 016	143	3 068
Nagara Falls 70 460—Niagara							
Mt St Mary's Hospital	Gen	Church	120	30	496	80	9 087
Nagara Falls Memorial Hospital	Gen	NP Assn	100	10	610	114	3 003
Northport 2 528—Suffolk							
Veterans Admin Facility	Ment	Vet	1 392			1 404	181
North Tonawanda 19 109—Niagara							
De Graff Memorial Hospital	Gen	City	45	18	280	30	1 628
Norwich 8 308—Chenango							
Chenango Memorial Hosp	Gen	NP Assn	68	15	104	34	1 164
Nyack 0 392—Rockland							
Nyack Hospital	Gen	NP Assn	88	16	266	72	2 011
Ogdenburg 16 915—St Lawrence							
A Barton Hepburn Hosp	Gen	Church	100	20	394	124	4 946
St John's Hospital	TB	Church	40			30	400
St Lawrence State Hosp**	Ment State	State	2 141			2 081	462
Rated capacity 1 721							
Olean 21 790—Cattaraugus							
Mountain Clinic	Gen	Indiv	30	6	96	21	604
Olean General Hospital	Gen	NP Assn	80	20	388	39	1,763
Rocky Crest Sanatorium	TB	County	40			30	400
Oleida 10 000—Madison							
Main Street Hospital	Gen	Indiv	10	4		Establish 1907	
Oleida City Hospital	Gen	City	83	17		New building	
Oneonta 12 000—Otsego							
Aurelia Osborn Fox Memorial Hospital	Gen	NP Assn	50	7	190	43	1 680
Homer Folks Tuberculosis Hospital*	TB	State	200			190	902
Orangeburg 360—Rockland							
Rockland State Hospital	Ment State	State	4 700			3 916	1,003
Rated capacity 4 000							
Ossining 15 241—Westchester							
Ossining Hospital	Gen	NP Assn	70	10	216	38	1 414
Stony Lodge	N&M	Indiv	32			18	700
Oswego 22 602—Oswego							
Oswego Hospital	Gen	NP Assn	89	11	272	41	1 518
Station Hospital	Gen	Army	60			22	700
Otisville 609—Orange							
Municipal Sanatorium*	TB	City	389			369	600
Owego 4 742—Tioga							
Glenmary Sanatorium	N&M	Corp	50			8	120
Peekskill 17 120—Westchester							
Peekskill Hospital	Gen	NP Assn	63	10	270	41	1,800
Penn Yan 3 329— Yates							
Soldiers and Sailors Memorial Hospital	Gen	NP Assn	40	10	107	24	1 020
Perryburg 317—Cattaraugus							
J N Adam Memorial Hosp	TB	City	400			400	371
Philmont 1 668—Columbia							
Columbia County Tuberculosis Hospital	TB	County	76			54	630
Plattsburg 13 340—Clinton							
Champlain Valley Hosp	Gen	Church	100	15	238	86	9 782
Physicians Hospital	Gen	NP Assn	81	18	No data supplied	40	1 600
Station Hospital	Gen	Army	64	2	28	40	1 600
Pomona 100—Rockland							
Summit Park Sanatorium	TB	County	74			54	670
Pt Chester 22 602—Westchester							
Mary Harkness Home for Convalescent Care	Conv	Corp	50			Establish 1907	
St Lutes Convalescent Hospital	Conv	Church	140			0	800
United Hospital*	Gen	NP Assn	100	20	616	10	4 700
Pt Jefferson 2 000—Suffolk							
John T Mather Memorial Hospital	Gen	NP Assn	50	12	145	34	1 100
St Charles Hospital for Crippled Children	Orth	McDe Church	210			260	200
Wharton Memorial In-titute Mental Unit of St Charles Hospital	Unit of St Charles Hospital						
Pt Jervis 10 200—Orange							
St Francis Hospital	Gen	Church	50	10	86	20	1 100

Key to symbols and abbreviations is on page 986

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Potsdam 4136—St Lawrence Hospital	Gen	NPA'ssn	54	21	174	37	1,701
Poughkeepsie 40 *8—Dutchess Hudson River State Hosp +	Ment State	State	4,378			4,399	707
	Rated capacity		4,014				
St Francis Hospital	Gen	Church	85	25	343	64	2,262
Samuel and Nettie Bowne Hospital	TbCard	NPA'ssn	50			32	95
Samuel W Bowne Memorial Hospital	TB	CyCo	134			122	121
Valar Brothers Hospital*	NPA'ssn		192	33	456	132	423
Queens Village—Queens Creedmoor State Hospital	Ment State	State	4,314			4,011	1,091
	Rated capacity		3,504				
Ray Brook 40—Essex New York State Hospital	TB	State	300			291	402
Rhinebeck 1569—Dutchess Northern Dutchess Health Service Center	Gen	NPA'ssn	35	8	97	28	664
Richland 404—Oswego Oswego County Sanatorium	TB	County	105			94	91
Rochester 378 132—Monroe Genesee Hospital**	Gen	NPA'ssn	107	32	694	170	5,969
Highland Hospital*	Gen	NPA'ssn	170	30	660	142	4,958
Iola Monroe County Tuberculosis Sanat*	TB	County	400			406	546
Monroe County Hospital	Gen	County	500	20	118	443	2,462
Park Avenue Hospital	Gen	NPA'ssn	85	20	368	60	2,367
Rochester General Hosp**	Gen	NPA'ssn	312	63	1,115	223	8,033
Rochester Municipal Hosp**	Gen	City	321	36	592	262	7,118
Rochester State Hospital*	Ment State	State	3,085			3,087	416
	Rated capacity		2,750				
St Mary's Hospital*	Gen	Church	200	25	578	147	5,186
Strong Memorial Hosp**	Gen	NPA'ssn	264	36	259	171	6,432
Rockaway Beach—Queens Neponset Beach Hospital for Children	TB	City	120			98	49
Rockaway Beach Hospital and Dispensary	Gen	NPA'ssn	115	10	216	96	2,787
Rockville Centre 13 718—Nassau South Nassau Communities Hospital	Gen	Corp	60	18	690	61	2,434
Rome 32 338—Oneida Oneida County Hospital	Gen	County	200	8	69	196	1,674
Rome Hospital and Murphy Memorial Hospital	Gen	City	5	16	431	50	2,125
Rome Infirmary	Gen	Indiv	25	6	18		170
Sackets Harbor 742—Jefferson Station Hospital	Gen	Army	30			18	509
Salamanca 9 577—Cattaraugus City Hospital	Gen	City	42	14	156	27	1,410
Sallybury Center 331—Herkimer Pine Crest Sanatorium	TB	County	90			90	68
Saranac Lake 8 020—Franklin General Hospital	Gen	NPA'ssn	34	10	80	27	886
Northwoods Sanatorium	TB	NPA'ssn	26			26	98
Reception Hospital	TB	NPA'ssn	20			20	31
St Mary's of the Lake	TB	Church	30			16	44
Will Rogers Memorial Hosp	TB	NPA'ssn	75			50	41
Saratoga Springs 13 169—Saratoga Saratoga Hospital	Gen	NPA'ssn	90	17	137	45	1,530
Schenectady 95 692—Schenectady Eastern New York Orthopedic Hospital School	OrthChil	NPA'ssn	35			16	84
Ellis Hospital*	Gen	NPA'ssn	251	34	700	254	8,359
Cleridge Sanatorium	TB	County	126			126	79
Seneca Falls 6 443—Seneca Seneca Falls Hospital	Gen	City	30	7	90	18	565
Sherburne 10 7—Chenango Chenango County Tuberculosis Hospital	TB	County	33			33	30
Sodus 1 444—Wayne Myers Hospital	Gen	Indiv	35	7	54	12	314
Sonyea—Livingston Craig Colony*	Epil State	State	9,156			2,312	352
	Rated capacity		1,990				
Southampton 3 737—Suffolk Southampton Hospital	Gen	NPA'ssn	100	19	227	46	1,715
Stapleton (Staten Island P O )	IRichmond						
U S Marine Hospital*	Gen	USPHS	716			677	6,965
Staten Island 1 8 346—Richmond Richmond Memorial Hosp	Gen	NPA'ssn	100	18	21	75	1,966
St Vincent's Hospital*	Gen	Church	208	37	684	168	937
Sea View Hospital*	TB	City	1,430		19	1,070	1,692
Staten Island Hospital*	Gen	Corp	219	49	1,062	168	5,919
Suffern 3 577—Rockland Good Samaritan Hospital	Gen	Church	41	10	173	46	2,166
Summout—Franklin Veterans Admin Facility	TB	Vet	570			348	416
Syracuse 909 3 6—Onondaga City Hospital	Gen	City	54			41	681
Crouse Irling Hospital*	Gen	NPA'ssn	215	25	689	200	6,813
Central Hospital*	Gen	NPA'ssn	85	25	31	74	2,756
Hospital of the Good Shepherd*	Gen	NPA'ssn	209			173	5,418
Onondaga General Hospital	Gen	NPA'ssn	0	25	45	29	837
Onondaga Sanatorium	TB	County	215			242	192
Peoples Hospital	Gen	NPA'ssn	33	10	52	8	749
St Joseph Hospital*	Gen	Church	200	31	650	167	7,224
St Mary's Maternity Hospital and Infants Asylum	Mat	Church	37	29	301	17	351
Syracuse Memorial Hospital*	Gen	NPA'ssn	210	40	1,074	190	5,961
Syracuse Psychopathic Hospital	Ment State	State	38			51	710
	Rated capacity		60				
Twin Elms	N CM	Indiv	10			8	65

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Tarrytown 6 841—Westchester Tarrytown Hospital	Gen	NPA'ssn	57	13	230	38	1,339
Ticonderoga 3 680—Essex Moses Ludington Hospital	Gen	NPA'ssn	47	6	98	31	925
Troy 72 763—Rensselaer Leonard Hospital	Gen	NPA'ssn	88	22	330	80	2,251
Marshall Sanatorium	N&M	NPA'ssn	60			48	312
St Joseph's Maternity Hosp	Mat	Church	30	28	208	12	346
Samaritan Hospital*	Gen	NPA'ssn	165	16	406	109	3,450
Troy Hospital*	Gen	Church	272	22	278	173	3,721
Trudeau 250—Essex Trudeau Sanatorium*	TB	NPA'ssn	200			211	254
Tupper Lake 5 271—Franklin Mercy General Hospital	Gen	Church	32	2	40	20	619
Tuxedo Park 2 000—Orange Tuxedo Memorial Hospital	Gen	NPA'ssn	33	7	50	17	543
Utica 101 740—Oneida Fulton Hospital	Gen	NPA'ssn	115	16	331	78	2,900
Masonic Soldiers and Sailors Memorial Hospital	Gen	Frat	200			111	314
Oneida County Tuberculosis Sanatorium	TB	County	180			170	165
St Elizabeth Hospital	Gen	Church	130	20	400	95	2,848
St Luke's Home and Hosp	Gen	Church	123	28	315	72	2,266
Utica General Hospital	Gen	City	117	8	264	68	3,330
Utica Memorial Hospital	Gen	NPA'ssn	72	20	279	45	2,305
Utica State Hospital*	Ment State	State	1,637			1,645	594
	Rated capacity		1,336				
Valhalla 620—Westchester Grasslands Hospital**	Gen	County	750	15	205	663	5,892
Warsaw 3 477—Wyoming Wyoming County Community Hospital	Gen	County	112	23	254	72	2,049
Warwick 2 433—Orange Warwick Hospital and Clinic	Gen	Indiv	20	4	25	9	328
Waterloo 4 047—Seneca Waterloo Memorial Hosp	Gen	NPA'ssn	13	5	63	13	407
Watertown 32 50—Jefferson House of the Good Samaritan	Gen	NPA'ssn	122	13	No data supplied		
Jefferson County Sanat*	TB	County	78			70	94
Mercy Hospital	Gen	Church	109	14	265	79	2,040
Waverly 5 662—Tioga Tioga County General Hosp	Gen	NPA'ssn	56	12	116	45	1,277
Wayland 1 814—Steuben Wayland Hospital	Gen	Part	17	3	43	8	358
Wellsville 5 674—Allegany Memorial Hospital of Wm F and Gertrude F Jones	Gen	City	45	10	240	32	1,342
West Haverstraw 2 834—Rockland New York State Reconstruction Home*	OrthChil	State	310			271	103
West Point 1 250—Orange Station Hospital	Gen	Army	158	8	55	79	2,076
White Plains 35 830—Westchester New York Hospital—Westchester Division*	N&M	NPA'ssn	330			249	342
New York Orthopaedic Dispensary and Hospital	Unit of New York Orthopaedic Dispensary and Hospital	New York City					
Country Branch							
St Agnes Hospital*	Gen	Church	104	32	519	79	3,074
White Plains Hospital	Gen	NPA'ssn	107	22	227	71	2,662
Willard 200—Seneca Willard State Hospital	Ment State	State	2,909			2,752	669
	Rated capacity		2,543				
Wingdale 156—Dutchess Harlem Valley State Hosp	Ment State	State	4,343			4,833	612
	Rated capacity		3,972				
Woodhaven—Queens St Anthony's Hospital	TB	Church	400			369	645
Wynantskill 167—Rensselaer Pawling Sanatorium	TB	County	152			127	136
Yonkers 134 646—Westchester Gray Oaks Hospital	TB	City	55			54	106
House of Rest at Sprain Ridge	TB	NPA'ssn	103			60	85
St John's Riverside Hosp**	Gen	NPA'ssn	176	24	503	137	4,915
St Joseph's Hospital*	Gen	Church	165	20	340	103	2,873
Yonkers General Hospital*	Gen	NPA'ssn	137	41	388	78	2,734
Related Institutions							
Albany 127 412—Albany Albany's Hospital for Incapacitated	Ine	NPA'ssn	85			85	58
Evergreens Sanatorium	Gen	Indiv	12			5	6
School	MeDe						
St Margaret's House and Hospital	Inst	Church	50			35	103
Albion 4 678—Orleans Albion State Training School	MeDe	State	493	3	6	507	152
	Rated capacity		436				
Orleans Welfare Hospital	Gen	County	41	5	14	32	115
Alden 846—Erie Erie County Penitentiary Hospital	Inst	County	22			9	113
Amityville 4 477—Suffolk Brunswick Home Sanit	MeDe	Corp	355			245	384
Auburn 36 652—Cayuga Auburn State Prison Hosp	Inst	State	35			6	149
Bainbridge 1 324—Chenango Bainbridge Hospital	Gen	Indiv	10	5	33	5	234
Bedford Hills 1 000—Westchester Westfield State Farm	Inst	State	45			26	454
Binghamton 6 662—Broome Binghamton Training School for Nervous Backward and Mental Defectives	MeDe	Indiv	50			35	42

Key to symbols and abbreviations is on page 986

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Breeseport 498—Chemung County Home Infirm	Inst	County	60			50	146
Brewster 1664—Putnam Mountainbrook Farm Sanit	Conv	Indiv	20			18	36
Brooklyn 2560,401—Kings Brooklyn Hebrew Home and Hospital for Aged	Inst	NPA'ssn	463			408	122
Churchill Sanitarium	Gen	Indiv	12	3	17	4	69
Faith Home for Incurables Inc	Inst	NPA'ssn	54			52	7
Hamilton Private Hospital	Gen	Indiv	22	4	24	10	293
Jewish Sanitarium and Hospital for Chronic Diseases	Chr	NPA'ssn	520			405	218
Buffalo 573 078—Erie Buffalo Eye and Ear Infirm	Inst	NPA'ssn	14			3	421
Ingleside Home	Mat	NPA'ssn	46	30	66	26	97
Calcium 111—Jefferson Jefferson County Contagious Hospital	Iso	County	18			2	22
Camden 1912—Onelida Healthforfe—Dr Bell's Private Rest Home	N&M	Indiv	15			3	8
Canandaigua 7541—Ontario Canandaigua Health Home	Conv	Indiv	20			13	68
Castile 900—Wyoming Greene Sanitarium	Conv	Indiv	40			20	90
Cortland 15 043—Cortland Cortland Sanitarium	Gen	Part	13	4	28	9	252
Dunnemora 3348—Clinton Clinton Prison General and Tuberculosis Hospital	Inst	State	25			78	823
Delhi 1840—Delaware Delaware Hospital	Gen	County	10			10	298
Delhi Hospital	Gen	NPA'ssn	14	6	40	5	201
Eastview 161—Westchester Solomon and Betty Loeb Memorial Home for Convalescents	Conv	NPA'ssn	103			113	1,614
Edmeston 749—Otsego Otsego School for Backward Children	MeDe	Indiv	27			24	8
Elmira 47397—Chemung Chemung County Preventorium	TbChil	County	22			17	31
Elmira Reformatory	Inst	State	100			25	921
Gleason Health Resort	Conv	Indiv	28			17	89
Far Rockaway—Queens Brooklyn Jewish Home for Convalescents	Conv	NPA'ssn	45			45	720
Wave Crest Convalescent Home	Orth	NPA'ssn	70			63	104
Herkimer 10406—Herkimer Herkimer County Home Hospital	Inst	County	18			16	51
Hudson 12337—Columbia New York State Training School for Girls	Inst	State	54	2	20	5	408
Industry—Monroe Industry General Hospital	Inst	State	70			36	491
Iroquois 40—Erie Thomas Indian School Hosp	Inst	State	36			10	322
Ithaca 20708—Tompkins Bailey Jones Hospital	Gen	Indiv	14			5	240
Conklin Sanitarium	Gen	Indiv	10			6	230
Reconstruction Home	Orth	NPA'ssn	80			50	67
Johnson City 13567—Broome Mrs Springer's Private Hospital	MatConv	Indiv	14	14	108		113
Keene Valley 400—Essex Keene Valley Neighborhood House and Hospital	Gen	NPA'ssn	0	2	17	5	123
Kingston 28088—Ulster Hackett Sanitarium and Nursing Home	Conv	Indiv	24			16	43
Lake Ronkonkoma 49—Suffolk Cary de Vabre Academy	MeDe	Part	18			12	6
Margaretville 771—Delaware Margaretville Hospital	Gen	NPA'ssn	14	5	47	5	206
Millgrove 110—Erie Erie County Home and Infirm	Inst	County	1300			1078	439
Montour Falls 1480—Schuyler Shepard Relief Hospital	Gen	NPA'ssn	20	8	101	17	681
Napanoch 633—Ulster Institution for Male Delinquents	MeDe	State	25			17	620
Newark 7640—Wayne Newark State School	MeDe	State	2150			1807	431
New York City 4211600—New York Beth Abraham Home for Incurables	Inc	NPA'ssn	205			251	77
Bronwood Sanitarium	Conv	Corp	20			16	74
Bryant Sanitarium	Mat	Indiv	10	10	90	3	97
Colored Orphan Asylum	Inst	NPA'ssn	20			13	480
Harts Island Prison Hosp	Inst	City	23			9	590
Hebrew Convalescent Home	Conv	NPA'ssn	80			70	686
Home for Aged and Infirm Hebrews	Inst	NPA'ssn	31			27	204
Home for Dependents	Inst	City	1747			1732	1060
Home for Hebrew Infants	Inst	NPA'ssn	61			34	1131
Home for Incurables	Inc	Church	304			222	277
House of Calvary	SkCa	Church	140			135	475
Dr Rogers Hospital	N&M	Indiv	20			13	17

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
St Andrew's Convalescent Hospital	Conv	Church	32			16	90
St Mary's Hospital for Children	Conv	Church	60			40	361
St Rose's Free Home for Incurable Cancer	Ca	Church	89			89	307
Woodstock Hospital	Gen	Indiv	16	20	No data supplied		
Niagara Falls 75460—Niagara Niagara Falls Municipal Hospital	Iso	City	33			10	191
Oneonta 12036—Otsego Parshall Private Hospital	Gen	Indiv	34	6	48	9	020
Onondaga, 260—Onondaga Onondaga County Hosp	InstGen	County	178	13	127	164	543
Oriskany 1142—Onelida Eastern Star Home and Infirm	Inst	Frat	82			72	7
Ossining 15241—Westchester Greenmont on Hudson	Ment	Indiv	19			11	19
Sing Sing Prison Hospital	Inst	State	100			56	2103
Oxford 1601—Chenango New York State Woman's Relief Corps Home	Inst	State	60			52	230
Pawling 1204—Dutchess White Oak Farm	N&M	Corp	19			12	2
Pelham Manor 4008—Westchester Pelham Home for Children	Conv	NPA'ssn	30			29	40
Pleasantville 4540—Westchester Hebrew Sheltering Guardian Orphan Asylum	Inst	NPA'ssn	33			6	31
Pt Jervis, 10243—Orange Deerpark Hospital	Gen	Corp	15	4	30	7	37
Poughkeepsie 40288—Dutchess Poughkeepsie City Home	Inst	City	50			37	14
Infirmary	Inst	City	9			7	104
Sadler Hospital	Inst	NPA'ssn	29			3	120
Swift Infirmary Vassar College	Inst	NPA'ssn	29			3	120
Queens Village, —Queens Queens Village Sanatorium	Gen	Indiv	10			48	6191
Rhinebeck 1569—Dutchess Holiday Farm Home for Convalescent Children	Conv	Indiv	25			23	163
Rochester 328132—Monroe Convalescent Hospital for Children	Conv	NPA'ssn	50			41	10
Field Sanitarium	Conv	Indiv	18				60
Knorr Sanitarium	N&M	Indiv	40			22	53
Rockaway Park—Queens Convalescent Home for Hebrew Children	ConvOrth	NPA'ssn	112			104	060
Rome 32338—Onelida Rome State School	MeDe	State	3604	24	24	3600	367
Rated capacity 3547							
Rye 8712—Westchester Halcyon Rest	N&M	Indiv	43			40	114
Schenectady 90692—Schenectady Bellevue Maternity Home	Mat	Indiv	12	14	282	9	99
Schenectady City Hospital	Iso	City	30			23	471
Schenectady County Home and Hospital	Inst	County	60			No data supplied	
Sea Cliff 3146—Nassau Country Home for Convalescent Babies	Conv	NPA'ssn	70			40	402
Staten Island 108346—Richmond New York City Farm Colony	Inst	City	1449			1017	310
Sailors Snug Harbor Hosp	Inst	NPA'ssn	104			120	487
Seaside Hospital	Chil	NPA'ssn	190			110	500
Syracuse 209326—Onondaga Syracuse State School	MeDe	State	1068			1008	106
Rated capacity 1066							
Thellus 320—Rockland Letchworth Village	MeDe	State	3624			3006	664
Rated capacity 3190							
Troy 72763—Rensselaer Rensselaer County Hospital	Chr	County	53			5	171
Troy Orphan Asylum	Inst	NPA'ssn	31				47
Tupper Lake 5271—Franklin American Legion Mountain Camp	Conv	NPA'ssn	55			41	196
Utica 101740—Onelida Children's Hospital Home of Utica	Orth	NPA'ssn	40			31	67
Valhalla 620—Westchester Blythedale Hospital and Home for Crippled Children	Orth	NPA'ssn	72			60	100
Valley Cottage 931—Rockland Reed Farm and Nichols Cottage	Conv	Indiv	13			15	23
Wallkill 700—Ulster Wallkill State Prison Hosp	Inst	State	20			4	179
Walesale 200—Dutchess Walesale State School	MeDe	State	2019			12	393
Rated capacity 3011							
Watertown 2220—Jefferson Jefferson County Home	Gen	County	0			00	00
White Plains 3050—Westchester Martine Farm Children's Cardiac Home	Card	Indiv	20			20	20
Williamsville 3119—Frie Joephine Goodyear Convalescent Home	Conv	Indiv	60			5	270

Key to symbols and abbreviations is on page 986

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Woodbourne 500—Sullivan Woodbourne Institution for Defective Delinquents	MeDe	State	750			446	235
Yonkers 134 646—Westchester Leake and Watts Home School	Inst	NP Assn	32			3	264
Yonkers City Hospital for Communicable Diseases	Loc	City	87			10	272
Summary for New York	Number	Beds	Average Census	Admissions			
Hospitals and sanatoriums	464	149 062	130 259	1 244 318			
Related institutions	109	26 640	23 533	33 033			
Totals	573	175 702	153 792	1 277 351			
Refused registration	30	1 050					

## NORTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albemarle 3 493—Stanly	Gen	NP Assn	27	6	66	14	642
Stanly General Hospital	Gen	NP Assn	30	10	110	16	900
Yadkin Hospital	Gen	NP Assn	36	6	82	18	975
Asheboro 5 021—Randolph	Gen	NP Assn	36	6	82	18	975
Randolph Hospital	Gen	NP Assn	36	6	82	18	975
Asheville 5 193—Buncombe	Gen	NP Assn	104	16	317	75	2 957
Ambler Heights Sanatorium	TB	Corp	25			14	76
Appalachian Hall	N&M	Corp	175			54	275
Asheville Mission Hosp	Gen	NP Assn	104	16	317	75	2 957
Asheville Physiatric Instl	Gen	NP Assn	104	16	317	75	2 957
tute Wesnoca	VerConv	Indiv	25			14	76
Aston Park Hospital	Gen	NP Assn	34	6	114	35	1 498
Norburn Hospital	Surge	Corp	35	1	16	31	1 163
St Joseph's Sanatorium	TB	Church	35			70	190
Zephyr Hill Sanatorium	TB	Indiv	30			2	38
Badin 3 040—Stanly	Gen	Corp	18	5	20	4	365
Badin Hospital	Gen	Corp	18	5	20	4	365
Banners Elk 340—Avery	Gen	Church	60	8	94	45	911
Grace Hospital	Gen	Church	60	8	94	45	911
Beaufort 2 957—Carteret	Gen	Corp	12	4	48	3	221
Potter Emergency Hospital	Gen	Corp	12	4	48	3	221
Biltmore 172—Buncombe	Gen	NP Assn	52	10	97	31	1 345
Biltmore Hospital	Gen	NP Assn	52	10	97	31	1 345
Black Mountain 737—Buncombe	N&M	Corp	20			No data supplied	
Beaumont Park Sanatorium	N&M	Corp	20			No data supplied	
Fellowship Sanatorium of the Royal League	TB	Frat	20			12	14
Cragmont Sanatorium	TB	Corp	30			14	16
Western North Carolina Sanatorium	TB	State	140			Estab	1937
Brevard 2 339—Transylvania	Gen	NP Assn	24	1	23	6	301
Lyday Memorial Hospital	Gen	NP Assn	24	1	23	6	301
Burlington 9 737—Alamance	Gen	NP Assn	42	5	57	27	955
Alamance General Hospital	Gen	NP Assn	42	5	57	27	955
Charlotte 82 675—Mecklenburg	Gen	NP Assn	42	5	57	27	955
Charlotte Eye Ear and Throat Hospital	ENT	Part	20			14	172
Good Samaritan Hospital (col)	Gen	Church	80	14	103	40	1 657
Mercy Hospital	Gen	Church	107	20	462	90	3 461
New Charlotte Sanatorium	Gen	Corp	100	10	15	70	3 095
Presbyterian Hospital	Gen	Church	100	10	264	106	3 931
St Peter's Hospital	Gen	Church	66	10	264	55	3 038
Cherokee 35—Swain	Gen	LA	28	5	65	16	726
Eastern Cherokee Hospital	Gen	LA	28	5	65	16	726
Crossnore 181—Avery	Gen	NP Assn	17	7	75	10	532
Garrett Memorial Hospital	Gen	NP Assn	17	7	75	10	532
Durham 59 037—Durham	Gen	NP Assn	400	50	443	307	10 954
Duke Hospital	Gen	NP Assn	99	9	126	53	1 375
Lincoln Hospital (col)	Gen	NP Assn	25			8	959
McPherson Hospital	ENT	Indiv	200	25	406	135	5 260
Watts Hospital	Gen	NP Assn	200	25	406	135	5 260
Elizabeth City 10 037—Pasquotank	Gen	NP Assn	43	6	50	20	801
Albemarle Hospital	Gen	NP Assn	43	6	50	20	801
Flinn 2 357—Surry	Gen	Church	45	4		29	
Hugh Chatham Memorial Hospital	Gen	Church	45	4		29	
Frwin 4 000—Harnett	Gen	NP Assn	34	8	74	6	211
Good Hope Hospital	Gen	NP Assn	34	8	74	6	211
Fayetteville 13 040—Cumberland	Gen	NP Assn	120	6	117	86	2 948
Higsmith Hospital	Gen	NP Assn	80	10	76	63	2 709
Pittman Hospital	Gen	NP Assn	80	10	76	63	2 709
Fletcher 60—Henderson	Gen	Church	50	3	62	34	816
Mountain Sanatorium and Hospital	Gen	Church	50	3	62	34	816
Ft Bragg—Cumberland Station Hospital	Gen	Army	100	7	88	92	2 839
Franklin 1 094—Macon	Gen	NP Assn	55	4	26	29	1 152
Angel Hospital	Gen	NP Assn	55	4	26	29	1 152
Gastonia 17 093—Gaston	Gen	Corp	60	8	No data supplied		
City Hospital	Gen	NP Assn	40	6	No data supplied		
Garron General Hospital	Gen	NP Assn	40	6	No data supplied		
North Carolina Orthopedic Hospital	Orth	State	160			158	345
Goldboro 14 955—Wayne	Gen	NP Assn	94	6	82	52	1 625
Goldsboro Hospital	Gen	NP Assn	94	6	82	52	1 625

## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
State Hospital (col)	Ment	State	2 150			1 902	510
Greensboro 14 985—Guilford	Gen	NP Assn	30			23	457
Glenwood Park Sanatorium	N&M	Indiv	30			23	457
Piedmont Memorial Hosp	Gen	NP Assn	55	6	143	43	2 376
L Richardson Memorial Hospital (col)	Gen	NP Assn	60	4	45	30	1 145
St Leo's Hospital	Gen	Church	79	12	104	60	2 256
Sternberger Hospital for Women and Children	Gen	NP Assn	40	12	172	15	673
Wesley Long Hospital	Gen	NP Assn	65	10	No data supplied		
Greenville 9 194—Pitt	Gen	Corp	60	5	60	39	1 424
Pitt General Hospital	Gen	Corp	60	5	60	39	1 424
Hamlet 4 801—Richmond	Gen	NP Assn	47	3	47	40	1 105
Hamlet Hospital	Gen	NP Assn	47	3	47	40	1 105
Hamptonville 75—Yadkin	Gen	Indiv	20	2	22	8	465
Trivette Clinic	Gen	Indiv	20	2	22	8	465
Henderson 6 345—Vance	Gen	Church	35	4	31	17	577
Jubilee Hospital (col)	Gen	NP Assn	40	5	109	23	1 264
Maria Parham Hospital	Gen	NP Assn	40	5	109	23	1 264
Hendersonville 5 070—Henderson	Gen	NP Assn	35	6	40	11	690
Patton Memorial Hospital	Gen	NP Assn	35	6	40	11	690
Hickory 7 363—Catawba	Gen	NP Assn	29	6	53	18	991
City Memorial Hospital	Gen	NP Assn	29	6	53	18	991
Richard Baker Hospital	Gen	Indiv	45	8	108	24	1 113
High Point 26 745—Guilford	Gen	NP Assn	68	7	110	49	1 873
Burrus Memorial Hospital	Gen	NP Assn	34	5	104	22	1 177
Guilford General Hospital	Gen	NP Assn	34	5	104	22	1 177
Huntersville 800—Mecklenburg	TB	County	166			144	150
Mecklenburg Sanatorium	TB	County	166			144	150
Jamestown 157—Guilford	TB	County	125			99	116
Guilford County Sanat	TB	County	125			99	116
Kinston 11 362—Lenoir	Gen	NP Assn	49	3	120	30	1 618
Memorial General Hospital	Gen	NP Assn	41	5	127	25	1 294
Parrott Memorial Hospital	Gen	NP Assn	41	5	127	25	1 294
Laurinburg 3 312—Scotland	Gen	NP Assn	30	3	24	13	402
Laurinburg Hospital	Gen	NP Assn	30	3	24	13	402
Leaksville 1 814—Rockingham	Gen	NP Assn	30	5	75	25	1 371
Leaksville General Hosp	Gen	NP Assn	30	5	75	25	1 371
Lenoir 6 532—Caldwell	Gen	NP Assn	25	7	123	13	632
Blackwelder Hospital	Gen	NP Assn	25	7	123	13	632
Caldwell Hospital	Gen	NP Assn	25	7	123	13	632
Dula Hospital	Gen	Indiv	14	5	29	6	457
Lexington 9 652—Davidson	Gen	NP Assn	24	6	32	8	452
Davidson Hospital	Gen	NP Assn	24	6	32	8	452
Lincolnton 3 781—Lincoln	Gen	NP Assn	24	6	32	8	452
Gordon Crowell Memorial Hospital	Gen	Corp	40	2	37	21	1 169
Reeves Hospital	Gen	Indiv	25	6	56	15	834
Lumberton 4 140—Robeson	Gen	NP Assn	69	6	204	59	2 625
Baker Sanatorium	Gen	NP Assn	75	10	218	61	2 752
Thompson Memorial Hosp	Gen	NP Assn	75	10	218	61	2 752
Manteo 547—Dare	Gen	Fed	18			10	157
Camp Wirth Hospital	Gen	Fed	18			10	157
Marion 2 467—McDowell	Gen	NP Assn	33	3	95	20	755
Marion General Hospital	Gen	NP Assn	33	3	95	20	755
Monroe 6 100—Union	Gen	NP Assn	35	5	49	14	577
Ellen Fitzgerald Hospital	Gen	NP Assn	35	5	49	14	577
Mooreville 5 619—Iredell	Gen	NP Assn	60	10	276	50	1 942
Lowrance Hospital	Gen	NP Assn	60	10	276	50	1 942
Morehead City 3 453—Carteret	Gen	City	28	3	101	15	499
Morehead City Hospital	Gen	City	28	3	101	15	499
Morganton 6 001—Burke	N&M	Part	75			49	223
Broad Oaks Sanatorium	N&M	Part	75			49	223
Grace Hospital	Gen	Church	52	10	232	29	1 593
State Hospital	Ment	State	2 272			2 093	71
Rated capacity 2 252							
Mt Airy 6 045—Surry	Gen	NP Assn	44	6	41	36	828
Martin Memorial Hospital	Gen	NP Assn	44	6	41	36	828
Murphy 1 612—Cherokee	Gen	Indiv	22	2	34	8	393
Petrie Hospital	Gen	Indiv	22	2	34	8	393
New Bern 11 951—Craven	Gen	NP Assn	35	3	74	19	1 002
St Luke's Hospital	Gen	NP Assn	35	3	74	19	1 002
North Wilkesboro 3 668—Wilkes	Gen	NP Assn	50	8	68	30	1 250
Wilkes Hospital	Gen	NP Assn	50	8	68	30	1 250
Oteen 504—Buncombe	TB	Vet	850			750	2 117
Veterans Admin Facility	TB	Vet	850			750	2 117
Oxford 4 101—Granville	Gen	NP Assn	14	1	11	7	253
Su Le Clay Cheatham Memorial Hospital (col)	Gen	NP Assn	14	1	11	7	253
Pinehurst 35—Moore	Gen	NP Assn	62	8	81	33	1 307
Moore County Hospital	Gen	NP Assn	62	8	81	33	1 307
Raleigh 37 379—Wake	Gen	Corp	34	8	113	21	1 053
Mary Elizabeth Hospital	Gen	Corp	34	8	113	21	1 053
Rex Hospital	Gen	NP Assn	174	25	397	125	4 619
St Agnes Hospital (col)	Gen	Church	90	10	119	69	1 323
State Hospital	Ment	State	2 105			2 154	950
Rated capacity 2 255							
Wake County Tuberculosis Hospital	TB	CyCo	24			Estab	1937
Reidsville 6 551—Rockingham	Gen	NP Assn	47	8	138	22	963
Memorial Hospital	Gen	NP Assn	47	8	138	22	963
Roanoke Rapid 3 404—Halifax	Gen	NP Assn	80	13	270	74	3 097
Roanoke Rapids Hospital	Gen	NP Assn	80	13	270	74	3 097
Rocky Mount 21 412—Nash	Gen	NP Assn	50			37	900
Atlantic Coast Line Hosp	Indus	NP Assn	110	10	190	83	2 955
Park View Hospital	Gen	NP Assn	75	6	62	41	1 241
Rocky Mount Sanatorium	Gen	NP Assn	75	6	62	41	1 241
Rutherford 2 020—Rutherford	Gen	NP Assn	60	4	39	22	1 569
Rutherford Hospital	Gen	NP Assn	60	4	39	22	1 569
Sallisbury 16 951—Rowan	Gen	NP Assn	69	12	168	53	2 123
Rowan Memorial Hospital	Gen	NP Assn	69	12	168	53	2 123

Key to symbols and abbreviations is on page 985

## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Sanatorium 57—Hoke North Carolina Sanatorium for the Treatment of Tu- berculosis	TB	State	485			471	693
Sanford 423—Lee	Gen	County	47	8	60	26	1,242
Shelby 10789—Cleveland Shelby Hospital	Gen	CyCo	6	10	16	43	1,609
Smithfield 2543—Johnston Johnston County Hospital	Gen	NPA'ssn	35	10	20	15	551
Southern Pines 224—Moore Pine-Crest Manor Sanat	TB	Indiv	43			26	71
Southport 1760—Brunswick Brunswick County Hospital	Gen	CyCo	34	5	48	17	713
Statesville 10400—Iredell Davis Hospital	Gen	Corp	180	12	132	92	3,162
H F Long Hospital	Gen	NPA'ssn	30	3	76	36	1,564
Sylva 1340—Jackson C J Harris Community Hospital	Gen	NPA'ssn	2	2	19	10	413
Tarboro 6379—Edgecombe Bass Memorial Hospital	Gen	Indiv	8	5	14	4	17
Edgecombe General Hosp	Gen	NPA'ssn	45	7	70	23	962
Thomasville 10090—Davidson City Memorial Hospital	Gen	City	31	5	35	16	60
Tyron 1670—Polk St Luke's Hospital	Gen	NPA'ssn	23	3	56	11	510
Wadesboro 3124—Anson Anson Sanatorium	Gen	NPA'ssn	4	8	74	30	1,172
Washington 7035—Beaufort Taylor Hospital	Gen	NPA'ssn	69	6	137	40	1,841
Waynesville 2414—Haywood Haywood County Hospital	Gen	County	86	12	202	67	1,620
Whiteville 2203—Columbus Columbus County Hospital	Gen	Indiv	25	4	57	13	806
Wilmington 3270—New Hanover Bulluck Hospital	Gen	Indiv	32	3	38	10	424
Community Hospital (col)	CyCo		26	4	81	17	720
James Walker Memorial Hospital	Gen	NPA'ssn	132	20	703	104	5,232
Wilmington Red Cross San- atorium	TB	NPA'ssn	38			30	32
Wilson 12613—Wilson Carolina General Hospital	Gen	NPA'ssn	40	10	No data supplied		
Woodard Herring Hospital	Gen	NPA'ssn	50	10	114	37	1,779
Winston Salem 7274—Forsyth City Memorial Hospital	Gen	City	172	19	338	125	4,756
Forsyth County Hospital	Gen	County	44	6	Estab 1907		
Forsyth County Sanatorium	TB	County	134		128	145	
North Carolina Baptist Hospital	Gen	Church	97	16	500	98	4,000
Wrightsville Sound 23—New Hanover Babies Hospital	Chil	NPA'ssn	35			14	260
Related Institutions							
Asheville, 50193—Buncombe Elmhurst Cottage Sanit	TB	Indiv	22			13	
Sunset Heights	TB	Corp	26			14	4
Violet Hill Sanatorium	TB	Indiv	57				
Biltmore, 172—Buncombe Hillcroft Sanatorium	TB	Part	40			20	52
Onteora Lodge	TB	Indiv	12			8	9
Candler 50—Buncombe Pisgah Sanitarium and Hospital	Gen	Church	30	4	16	14	400
Charlotte 8267—Mecklenburg Florence Crittenton Indus- trial Home	Mat	NPA'ssn	30	5	No data supplied		
Davidson 144—Mecklenburg Davidson College Infirmary	Inst	NPA'ssn	12			8	126
Fayetteville 13049—Cumberland Fayetteville Eye Ear Nose and Throat Hospital	ENT	Part	12			4	568
Halifax 321—Halifax Halifax County Tuberculo- sis Sanitarium	TB	County	24			15	27
Henderson 6345—Vance Scott Parker Sanatorium	TB	County	14			7	
Kinston 11362—Lenoir Caswell Training School	McDe	State	717			660	80
			Rated capacity 800				
Monroe, 6100—Union Quality Hill Sanitarium (col)	Gen	Indiv	18	4	4	8	100
North Wilkesboro 3668—Wilkes Wilkes County Tuberculosis Hut	TB	County	14			7	14
Oxford 4101—Granville William J Hicks Memorial Hospital	Inst	Frat	72				
Pinebluff 297—Moore Pinebluff Sanitarium	N&M	Part	31			22	121
Raleigh 37379—Wake McCauley Private Hospital (col)	Gen	Indiv	10	2	15	4	96
North Carolina State School for the Blind and Deaf	Inst	State	18			2	106
Roaring Gap—Alleghany Roaring Gap Baby Hosp	Chil	Indiv	30			32	139
Saluda 58—Polk Infants and Children's Sanit	Chil	Indiv	5			2	127
Spartanburg Baby Hosp	Chil	NPA'ssn	35			25	150
Tarboro 6379—Edgecombe Edgecombe County Tubercu- lar Sanatorium	TB	County	2			New building	

## NORTH CAROLINA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Thomasville 10090—Davidson Mills Home Infirmary	Inst	Church	30			7	214
Washington 7035—Beaufort S R Fowle Memorial Hosp	Gen	NPA'ssn	16	2	No data supplied		
Wilson 12613—Wilson Mercy Hospital (col)	Gen	CyCo	3	2	27	24	61
Summary for North Carolina							
			Number	Beds	Average Census	Admissions	
Hospitals and sanatoriums			132	15,495	19,400	1,059	
Related institutions			24	1,540	913	352	
Totals			156	16,835	20,313	1,411	
Refused registration			5	181			

## NORTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Ambrose 334—Divide Lutheran Good Samaritan Hospital	Gen	Church	15	4	49	6	27
Belcourt 20—Rolette Turtle Mountain Hospital	G&TB	IA	50	10	104	3	500
Bismarck 11060—Burleigh Bismarck Hospital	Gen	Church	123	12	11	81	2,353
St Alexis Hospital	Gen	Church	140	6	210	9	2,354
Bottineau 1322—Bottineau St Andrew's Hospital	Gen	Church	60	10	171	50	1,419
Carrington 1717—Foster Carrington Hospital	Gen	Corp	22	4	37	9	550
Carson 36—Grant Carson Hospital	Gen	Indiv	8	3	37		16
Devils Lake 5401—Ramsey General Hospital	Gen	NPA'ssn	44	6	7	30	57
Mercy Hospital	Gen	Church	100	26	200	51	1,000
Dickinson 502—Stark St Joseph's Hospital	Gen	Church	85	10	17	46	1,000
Drayton 502—Pembina Drayton Hospital	Gen	NPA'ssn	14	4	47	10	501
Fargo 28619—Cass St John's Hospital	Gen	Church	13	70	412	123	4,610
St Luke's Hospital	Gen	Church	108	17	207	64	4,411
Veterans Admin Facility	Gen	Vet	100			93	814
Ft Lincoln (Bismarck P O)—Burleigh Station Hospital	Cen	Army	80			3	674
Ft Totten 12—Benson Ft Totten Hospital	Gen	IA	37	4	4	18	750
Ft Yates 400—Sioux Standing Rock Indian Hos- pital	Gen	IA	53	3	76	22	71
Grafton 3,136—Walsh Grafton Deaconess Hosp	Gen	Church	44	6	277	31	1,020
Grand Forks 17112—Grand Forks Grand Forks Deaconess Hospital	Gen	NPA'ssn	9	2	293	73	2,897
St Michael's Hospital	Gen	Church	60	12	267	44	1,923
Harvey 2157—Wells Good Samaritan Hospital and Sanitarium	Gen	NPA'ssn	30	6	7	14	50
Jamestown 8187—Stutsman North Dakota State Hospi- tal for Insane	Ment	State	2,007			1,500	34
			Rated capacity 2,010				
Trinity Hospital	Gen	Church	77	12	193	34	1,000
Kenmare 1494—Ward Kenmare Deaconess Hosp	Gen	Church	4	5	86	20	63
Linton 1192—Emmons Linton Hospital	Gen	Indiv	10	5	61	5	299
Mandan 5037—Morton Mandan Deaconess Hospital	Gen	Church	3	8	127	2	1,057
McVie 513—Nelson Community Ho pital	Gen	Corp	17	4	61	7	391
Minot 16093—Ward McCannel's Private Hosp	F&T	Indiv	12			5	499
St Joseph's Hospital	Gen	Church	100	14	242	74	2,993
Trinity Ho pital	Gen	Church	110	16	267	99	3,699
New Rockford 219—Eddy Donahue Hospital	Gen	Indiv	12	3	73	4	000
Northwood 971—Grand Forks Northwood Deaconess Hospital	Gen	NPA'ssn	2	4	67	12	491
Oakes 1709—Dickey Mercy Hospital	Gen	Church	2	16	29	5	177
Rolette 428—Rolette Community Hospital	Gen	NPA'ssn	13	6	No data supplied		
Rugby 1512—Pierce Good Samaritan Hospital	Gen	Church	59	12	223	45	1,715
San Haven—Rolette North Dakota State Tuber- culosis Sanatorium	TB	State	40			22	217
Valley City 5,272—Barnes Mercy Hospital	Gen	Church	8	13	17	5	171
Wahpeton 3176—Richland Wahpeton Ho pital	Gen	Part	21	6	51	12	3
Williston 310—Williams Good Samaritan Hospital	Gen	Church	4	11	17	70	1,277
Mercy Ho pital	Gen	Church	109	12	109	2	1,311

Key to symbols and abbreviations is on page 986



NORTH DAKOTA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Bismarck 11 090—Burlleigh North Dakota State Penitentiary Hospital	Inst	State	40			16	296
Bowman 888—Bowman Bowman Hospital	Gen	Indiv	7	6	14	3	110
Elbowoods 139—McLean Ft Berthold Indian Hosp	Gen	IA	20	5	52	15	561
Elgin 500—Grant Elgin Hospital	Gen	City	6	2	26	3	93
Fargo 25 610—Cass Camp Maternity Hospital	Mat	Indiv	15	10	63		63
Cass County Hospital	Gen	County	30	3	63	20	393
Florence Crittenton Home	Mat	NPA's'n	70	6	60	30	77
Grafton 3 136—Walsh Grafton State School	MeDe	State	1 067			797	141
		Rated capacity	970				
Grand Forks 17 112—Grand Forks Grand Forks City Hospital Iso	City		16			1	32
Jamestown 8 187—Stutsman Isolation Hospital	Iso	CyCo	12	1			12
Jamestown Hospital	Gen	NPA's'n	33	6	112	21	767
Mayville 1 190—Trall Union Hospital	Gen	NPA's'n	16	6	40	6	346
Summary for North Dakota							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	39	4 625	3 417	40 951			
	13	1 302	974	3 065			
Total	52	6 010	4 341	49 016			
Refused registration	4	71					

OHIO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Alcon 20 040—Summit Children's Hospital	Chil	NPA's'n	110			80	2 807
City Hospital	Gen	NPA's'n	324	41	1 567	210	9 422
Peoples Hospital	Gen	NPA's'n	130	20	665	80	4 071
St Thomas Hospital	Gen	Church	145	29	688	127	4 730
Alliance 23 047—Stark Alliance City Hospital	Gen	City	80	15	290	43	1 060
Amherst 2 544—Lorain Pleasant View Sanatorium	TB	County	90			76	73
Ashland 11 141—Ashland Samaritan Hospital	Gen	NPA's'n	26	8	174	16	730
Ashabula 23 301—Ashabula Ashabula General Hosp	Gen	NPA's'n	70	14	200	48	1 718
Athen 7 000—Athens Athens State Hospital	Ment	State	1 705			1 632	332
		Rated capacity	1 500				
Sheltering Arms Hospital	Gen	Indiv	30	7		No data supplied	
Barberton 23 934—Summit Citizens Hospital	Gen	Corp	52	10	242	32	1 099
Barnesville 4 602—Belmont Barnesville General Hosp	Gen	Corp	14	4	19	5	180
Bedford 6 814—Cuyahoga Bedford Municipal Hospital	Gen	City	27	9	107	12	518
Bellaire 13 320—Belmont City Hospital	Gen	NPA's'n	60	10	206	34	1 011
Bellevue 6 006—Huron Bellevue Hospital	Gen	NPA's'n	29	6	67	10	230
Berea 5 694—Cuyahoga Community Hospital	Gen	NPA's'n	32	9	142	27	803
Bryan 4 689—Williams Cameron Hospital	Gen	Indiv	18	5	41	7	387
Bucyrus 10 027—Crawford Bucyrus City Hospital	Gen	City	37	6	120	20	737
Cambridge 14 013—Guernsey St Francis Hospital	Gen	Indiv	20	3	23	12	533
Canton 104 906—Stark Aultman Hospital	Gen	NPA's'n	147	24	670	100	3 867
Little Flower Hospital	Unit of	Mercy Hospital					
Mercy Hospital	Gen	Church	19	32	978	109	6 400
Molly Stark Sanatorium	TB	County	106			107	279
Celina 4 664—Mercer Otis Hospital	Gen	Indiv	26	4	36	12	420
Chagrin Falls 2 739—Cuyahoga Windsor Hospital	N&M	Corp	50			20	106
Chillicothe 18 340—Ross Chillicothe Hospital	Gen	NPA's'n	60	6	193	36	763
St Logan Sanatorium	TB	County	60			57	64
Industrial Reformatory	Inst	USPHS	90			36	990
Veterans Admin Facility	Ment	Vet	944			1 020	215
Cincinnati 43 160—Hamilton Bethel Hospital	Gen	Church	199	40	849	170	5 933
Children's Hospital	Chil	Church	216			133	4 122
Christ Hospital	Gen	Church	304	48	846	206	7 520
Christian R Holmes Hosp	Gen	City	02			32	1 000
Cincinnati Gen Hosp	Gen	City	860	60	1 993	690	15 304
Cincinnati Sanatorium	N&M	Corp	70			73	190
Deaconess Hospital	Gen	Church	100	20	530	121	4 282
Good Samaritan Hosp	Gen	Church	470	70	1 491	300	10 708
Hamilton County Tubercu- lois Sanatorium	TB	County	642			624	669

OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Jewish Hospital	Gen	NPA's'n	225	37	719	176	5 713
Longview State Hospital	Ment	State	2 690			2 454	538
		Rated capacity	1 867				
Ohio Hospital for Women and Children	Unit of	Bethesda Hospital					
St Mary Hospital	Gen	Church	212	20	460	148	4 801
Circleville 7 369—Pickaway Berger Hospital	Gen	City	25	4	70	9	476
Cleveland 900 429—Cuyahoga Babies and Childrens Hosp	Unit of	University Hospitals					
City Hospital	Gen	City	1 521	53	1 349	1 316	14 482
City Psychopathic Hospital	Unit of	City Hospital					
Cleveland Clinic Founda- tion Hospital	Gen	NPA's'n	233			144	5 007
Cleveland State Hospital	Ment	State	2 795			2 768	403
		Rated capacity	2 006				
East 50th Street Hospital	Gen	Corp	60	12			
Evangelical Deaconess Hos- pital	Gen	Church	109	35	639	102	2 151
Fairview Park Hospital	Gen	Church	91	18	450	75	3 093
Glenville Hospital	Gen	NPA's'n	88	21	466	75	2 313
Grace Hospital	Gen	NPA's'n	32			17	920
John H Lowman Memorial Pavillion	Unit of	City Hospital					
Lakeside Hospital	Unit of	University Hospitals					
Leonard C Hanna House	Unit of	University Hospitals					
Lutheran Hospital	Gen	Church	109	28	807	90	4 005
Maternity Hospital	Unit of	University Hospitals					
Mt Sinai Hospital	Gen	NPA's'n	225	45	664	194	8 270
Polyclinic Hospital	Gen	NPA's'n	90	15	290	79	2 637
Prospect Hospital	N&M	Corp	133			88	107
Provident Hospital	Gen	NPA's'n	25	12	No data supplied		
St Alexis Hospital	Gen	Church	220			102	5 491
St Anns Maternity Hos- pital	Mat	Church	60	60	1 385	42	1 510
St Johns Hospital	Gen	Church	182	32	785	148	5 579
St Luke's Hospital	Gen	Church	336	55	1 373	270	11 302
St Vincent Charity Hos- pital	Gen	Church	290			230	5 879
U S Marine Hospital	Gen	USPHS	201			220	2 561
University Hospitals	Gen	NPA's'n	698	118	1 992	537	18 469
Woman's Hospital	Gen	NPA's'n	93	17	379	85	2 098
Columbus 290 564—Franklin Children's Hospital	Chil	NPA's'n	100			70	2 288
Columbus Radium Hospital	Gen	NPA's'n	32	6	40	21	708
Columbus State Hospital	Ment	State	2 609			2 644	584
		Rated capacity	2 400				
Franklin County Sanat- ory	TB	County	210			180	159
Dr Gaver Sanatorium	N&M	Indiv	20			15	96
Grant Hospital	Gen	NPA's'n	303	30	707	193	6 639
McMillen Sanatorium	N&M	Corp	30			22	130
Mercy Hospital	Gen	NPA's'n	60	15	145	55	1 348
Mt Carmel Hospital	Gen	Church	200	20	501	106	4 385
St Anns Infant Asylum and Maternity Hospital	Mat	Church	20	20	541	11	501
St Anthony's Hospital	Gen	Church	204			171	687
St Clair Hospital	Gen	NPA's'n	24	4	20	13	426
St Francis Hospital	Gen	State	160			122	2 983
Starling Loving University Hospital	Gen	State	206	32	581	166	5 989
Station Hospital	Gen	Army	225	0	26	100	2 127
White Cross Hospital	Gen	Church	243	28	823	183	7 003
Conneaut 9 691—Ashabula Brown Memorial Hospital	Gen	NPA's'n	30	5	122	20	842
Coshocton 10 908—Coshocton Coshocton City Hospital	Gen	City	37	8	138	23	1 095
Crestline 4 420—Crawford Crestline Emergency Hosp	Gen	NPA's'n	16	4	43	7	2 100
Cuyahoga Falls 19 707—Summit Fair Oaks Villa	N&M	NPA's'n	60			57	164
Dayton 200 982—Montgomery Dayton State Hospital	Ment	State	1 674			1 691	492
		Rated capacity	1 418				
Good Samaritan Hospital	Gen	Church	200	48	816	108	4 440
Miami Valley Hospital	Gen	NPA's'n	329	46	1 290	300	10 460
St Anns Maternity Hosp	Unit of	St Elizabeth Hospital					
St Elizabeth Hospital	Gen	Church	365	30	1 310	221	7 105
Stillwater Sanatorium	TB	County	94			82	102
Veterans Admin Facility	Gen	Vet	1 102			891	4 986
Defiance 8 818—Defiance Defiance Hospital	Gen	NPA's'n	30	5	71	17	763
Dennison 4 529—Tuscarawas Twin City Hospital	Gen	NPA's'n	27	4	63	13	500
Dover 9 716—Tuscarawas Union Hospital	Gen	NPA's'n	70	10	151	31	1 173
East Cleveland 39 667—Cuyahoga East Cleveland Hospital and Clinic	Gen	Corp	10			3	200
Huron Road Hospital	Gen	NPA's'n	202	36	1 002	177	6 977
East Liverpool 23 320—Columbiana East Liverpool City Hosp	Gen	City	80	15	346	59	2 102
Elyria 20 633—Lorain Elyria Clinic Hospital	Gen	NPA's'n	20	4	40	8	227
Elyria Memorial Hospital	Gen	NPA's'n	104	29	496	93	2 664
Gates Hospital for Crippled Children	Unit of	Elyria Memorial Hospital					
Findlay 19 003—Hancock Home and Hospital	Gen	City	63	12	221	23	1 023
Fremont 13 422—Sandusky Community Hospital	Gen	Indiv	12	4	70	0	201

OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Memorial Hospital of Sandusky County	Gen	NPA's'n	42	12	302	42	1 331
Gallion 7 674—Crawford	Gen	NPA's'n	12	5	93	10	408
Good Samaritan Hospital	Gen	NPA's'n	12	5	93	10	408
Gallipolis 7 106—Gallia	Gen	NPA's'n	12	5	93	10	408
Holzer Hospital	Gen	Part State	51	4	49	38	1 826
Ohio Hospital for Epileptics	Epil	State	2 300		2 126		760
			Rated capacity 1 900				
Green Springs 750—Sandusky and Seneca	Gen	NPA's'n	75				
Oak Ridge Sanatorium	TB	Indiv	75			55	70
Greenville, 7 036—Darke	Gen	NPA's'n	28	4	110	18	722
Greenville Hospital	Gen	NPA's'n	28	4	110	18	722
Hamilton, 62 176—Butler	Gen	NPA's'n	85	24	381	57	1 687
Fort Hamilton Hospital	Gen	NPA's'n	85	24	381	57	1 687
Mersey Hospital	Gen	Church	275	25	494	100	3 316
Hillsboro 4 040—Highland	Gen	NPA's'n	14	4	53	7	349
Hillsboro Hospital	Gen	NPA's'n	14	4	53	7	349
Ironton 16 521—Lawrence	Gen	NPA's'n	64	12			
Lawrence County General Hospital	Gen	County	64	12			
Martins Hospital	Gen	Corp	25	5	63		1937
Kenton 7 069—Hardin	Gen	NPA's'n	25	5	70	24	717
McKittick Hospital	Gen	NPA's'n	25	5	70	24	717
San Antonio Hospital	Gen	Church	21	5	31	13	292
Lakewood 70 500—Cuyahoga	Gen	City	67	16	399	61	2 160
Lakewood City Hospital	Gen	City	67	16	399	61	2 160
Lima 42 487—Allen	TB	County	124			82	187
District Tuberculosis Hosp	TB	State	1 191			1 120	162
Lima State Hospital	Gen	Church	100	16	248	71	2 172
St Rita's Hospital	Gen	NPA's'n	20	5	145	16	902
Lodi 1 273—Medina	Gen	NPA's'n	20	5	145	16	902
Lodi Hospital	Gen	NPA's'n	20	5	145	16	902
Logan 6 080—Hocking	Gen	NPA's'n	50	3	32	15	308
Cherrington Hospital	Gen	Church	100	20	4 6	80	2 546
Lorain, 44 512—Lorain	Gen	NPA's'n	110	17	576	79	3 207
St Joseph's Hospital	Gen	NPA's'n	54	10	148	29	1 276
Mansfield, 33 527—Richland	Gen	NPA's'n	40	10	196	30	1 300
Mansfield General Hospital	Gen	NPA's'n	40	10	196	30	1 300
Marletta, 14 285—Washington	Gen	NPA's'n	40	10	196	30	1 300
Marletta Memorial Hospital	Gen	NPA's'n	40	10	196	30	1 300
Marion, 31 084—Marion	Gen	NPA's'n	40	10	196	30	1 300
Marion City Hospital	Gen	NPA's'n	40	10	196	30	1 300
Sawyer Sanatorium	Gen	NPA's'n	40	10	196	30	1 300
Martins Ferry, 14 525—Belmont	Gen	NPA's'n	80	10	264	76	2 976
Martins Ferry Hospital	Gen	NPA's'n	80	10	264	76	2 976
Massillon 26 400—Stark	Gen	NPA's'n	92	14	387	55	2 334
Massillon City Hospital	Gen	NPA's'n	92	14	387	55	2 334
Massillon State Hospital	Gen	NPA's'n	92	14	387	55	2 334
			Rated capacity 2 050				
McConnellsville 1 754—Morgan	TB	Corp	150			134	169
Rocky Glen Sanatorium	TB	Corp	150			134	169
Mentor 1,589—Lake	N&M	Corp	101			158	105
Dellhurst Sanitarium	N&M	Corp	101			158	105
Middletown 26 992—Butler	Gen	NPA's'n	100	20	547	76	2 577
Middletown Hospital	Gen	NPA's'n	100	20	547	76	2 577
Mt Vernon 9 370—Knox	Gen	Church	35	8	167	23	1 701
Mersey Hospital	Gen	Church	42	8	137	25	1 132
Mt Vernon Hospital Sanft	Gen	Church	42	8	137	25	1 132
Ohio State Sanatorium	TB	State	240			220	412
Newark 30 590—Licking	TB	County	57			50	108
Licking County Tuberculo	TB	County	57			50	108
sis Sanatorium	TB	County	57			50	108
Newark Hospital	Gen	NPA's'n	88	18	232	55	2 121
North Royalton (Brecksville P O)	TB	Corp	110			109	138
Mount Royal Sanatorium	TB	Corp	110			109	138
Norwalk 7 776—Huron	Gen	NPA's'n	28	7	122	16	505
Norwalk Memorial Hospital	Gen	NPA's'n	28	7	122	16	505
Oberlin 4 292—Lorain	Gen	NPA's'n	36	5	65	17	1 150
Allen Hospital Oberlin Col	Gen	NPA's'n	36	5	65	17	1 150
lege	Gen	NPA's'n	36	5	65	17	1 150
Perrysburg 3 182—Wood	Gen	Indiv	13	3	46	7	311
Community Hospital	Gen	Indiv	13	3	46	7	311
Rheinfrank Hospital	Gen	Indiv	13	3	46	7	311
Piquette 16 009—Miami	Gen	NPA's'n	53	7	206	37	1 400
Memorial Hospital	Gen	NPA's'n	53	7	206	37	1 400
Pt Clinton 4 408—Ottawa	Gen	Indiv	16	4	25	11	306
Pool Hospital	Gen	Indiv	16	4	25	11	306
Portsmouth 42 560—Scioto	Gen	Church	75	11	260	58	2 377
Mersey Hospital	Gen	Church	75	11	260	58	2 377
Portsmouth General Hosp	Gen	Church	75	11	260	58	2 377
Schirman Hospital	Gen	NPA's'n	50	6	35	35	778
Ravenna 8 019—Portage	Gen	County	49	9	210	38	1 379
Robinson Memorial Hosp	Gen	County	49	9	210	38	1 379
St Clairsville 2 440—Belmont	TB	County	56			53	45
Belmont Sanatorium	TB	County	56			53	45
Salem 10 622—Columbiana	Gen	NPA's'n	30	6	59	18	670
Central Clinic and Hospital	Gen	NPA's'n	30	6	59	18	670
Salem City Hospital	Gen	NPA's'n	30	6	59	18	670
Sandusky 23 622—Erie	Gen	NPA's'n	70	11	219	37	1 652
Good Samaritan Hospital	Gen	NPA's'n	70	11	219	37	1 652
Providence Hospital	Gen	NPA's'n	70	11	219	37	1 652
Shelby 6 198—Richland	Gen	NPA's'n	27	6	99	14	570
Shelby Memorial Hospital	Gen	NPA's'n	27	6	99	14	570
Sidney 9 301—Shelby	Gen	NPA's'n	20	5	77	13	676
Wilson Memorial Hospital	Gen	NPA's'n	20	5	77	13	676
South Euclid 4 390—Cuyahoga	Gen	NPA's'n	20	5	77	13	676
Rainbow Hospital for Crip	Gen	NPA's'n	20	5	77	13	676
pled and Convalescent Chil	Gen	NPA's'n	20	5	77	13	676
dren	Gen	NPA's'n	20	5	77	13	676
Springfield 68 743—Clark	TB	County	120			102	118
Clark County Tuberculo	TB	County	120			102	118
sis Sanatorium	TB	County	120			102	118

OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinetts	Number of Births	Average Census	Admissions
Springfield City Hospital	Gen	City	258	40	701	129	4 613
Springfield Lake—Summit							
Edwin Shaw Sanatorium	TB	County	208			191	25
Steubenville 35,422—Jefferson							
Gill Memorial Hospital	Gen	Church	30			99	271
Ohio Valley Hospital	Gen	NPA's'n	150		658	109	4 141
Tiffin, 16 428—Seneca							
Mersey Hospital	Gen	Church	35	8		25	1 061
Toledo, 290 718—Lucas							
East Side Hospital	Gen	NPA's'n	41	4	77	18	811
Flower Hospital	Gen	Church	107	25	455	57	2 075
Lucas County Gen Hosp	Gen	County	282	37	465	291	1 875
Mersey Hospital	Gen	Church	110	25	400	53	3 009
Robinson Hospital	Gen	Church	91	13	191	41	1 110
St Vincent's Hospital	Gen	Church	309	45	899	97	3 115
Toledo Hospital	Gen	NPA's'n	250	25	492	114	3 711
Toledo Sanatorium	N&M	Corp	20				
Toledo State Hospital	Gen	NPA's'n	2 631			2 616	4 071
		Rated capacity	2 038				
William Roche Tuberculosis Hospital	TB	County	170				1937
Women's and Children's Hospital	Gen	NPA's'n	121	29	415	16	95
Troy 8 675—Miami							
Stouder Memorial Hospital	Gen	City	44	8	144	56	1 011
Urbana 7 742—Champaign							
Champaign County Hosp	Gen	County	28	6	90	18	54
Van Wert 8 472—Van Wert							
Van Wert County Hospital	Gen	NPA's'n	44	6	73	19	61
Wadsworth 5 930—Medina							
Wadsworth Municipal Hosp	Gen	City	28	14	137	13	54
Warren, 41 062—Trumbull							
St Joseph's Riverside Hosp	Gen	Church	40	10	363	41	2 065
Trumbull County Tubercu- losis Sanatorium	TB	County	50			47	113
Warren City Hospital	Gen	NPA's'n	107	20	365	11	3 221
Warrensburg 1 507—Cuyahoga							
Sunny Acres Cleveland Tu- berculosis Sanatorium	TB	City	431			471	49
Wauseon 2 689—Fulton							
De Ette Harrison Detwiler Memorial Hospital	Gen	NPA's'n	46	7	111	50	1 005
Willard 4 514—Huron							
Willard Municipal Hospital	Gen	City	24	6	51	15	65
Wilmington 5 332—Clinton							
Dr Kelley Hale Surgical Hospital	Gen	Indiv	17	7	18	7	23
Wooster 10 742—Wayne							
Kinney and Kneserick Hosp	Gen	Corp	25		No data	supplied	
Wooster Hospital	Gen	Indiv	29	2	2	9	37
Worthington 1 230—Franklin							
Harding Sanitarium	N&M	Corp	40			5	1
Xenia 10 507—Greene							
McClellan Hospital	Gen	Corp	20	4	40	13	11
Youngstown 170 002—Mahoning							
Mahoning Tuberculosis San- atorium	TB	County	160			19	117
St Elizabeth's Hospital	Gen	Church	261	25	919	116	6 665
Youngstown Hospital	Gen	NPA's'n	312	58	1 050	225	9 172
Zanesville 36 440—Muskingum							
Bethesda Hospital	Gen	NPA's'n	110	20	475	45	2 071
Good Samaritan Hospital	Gen	Church	125	20	437	74	1 090
Related Institutions							
Akron 2,040—Summit							
Akron Clinic	Gen	Part	12			5	39
Goodyear Hosp and Disp	Indus	Corp	25			5	39
Just A Mere Home and Hos- pital	N&M	Indiv	1.0			10	
Apple Creek 450—Wayne							
Institution for Feeble-minded	MeDe	State	50			515	19
		Rated capacity	596				
Barnesville 4 602—Belmont							
Community Hospital	Gen	NPA's'n	14	2	13	6	415
Bay Village 2 294—Cuyahoga							
Cedarcrest Sanitarium	N&M	Corp	100			51	3
Bellefontaine 9 543—Logan							
Harbert Hospital	F&T	Indiv	6			2	1
Bluffton 2 035—Allen							
Bluffton Community Hosp	Gen	NPA's'n	19	4	75	9	5
Cambridge 14 617—Guernsey							
Children and Maternity Hos- pital	MatCh	NPA's'n	17	8	70	6	5
Swan Hospital	Gen	NPA's'n	35	4	75	14	45
Colina 4 664—Mercer							
Gibbons Hospital	Gen	NPA's'n	19	4	44	10	47
Cincinnati 41 160—Hamilton							
Catherine Booth Home and Hospital	Mat	Church	10	10	90	11	6
Children's Convalescent Home of the Cincinnati							
Orphan Asylum	Inst	NPA's'n	100			5	20
Children's Home	Inst	NPA's'n	53			11	31
Evangeline Home Hospital and Nursery	Mat	Church	25	4	21	3	1
Hamilton County Home & Chronic Disease Hospital	Chr	County	50			11	11
Home for Incurables	Inc	NPA's'n	75				
Jewell Convalescent and Foster Home	Conv	NPA's'n	75			12	45
Maple Knoll Hospital and Home for the Friendless	Mat	NPA's'n	8	15	1	10	47

## OHIO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Ophthalmic Hospital	EAT	Indiv	10			2	223
Ridge Rest Home	N CM	Corp	3			24	62
St Francis Hospital for Incubables	Inc	Church	292			233	212
St Joseph Maternity Hospital and Infant Asylum	Mat	Church	20	20	90		85
Cleveland 900 479—Cuyahoga Booth Memorial Home and Hospital	Mat	Church	17	17	338	12	346
Children's Fresh Air Camp and Hospital	Conv	NPA'ssn	60			60	235
Emergency Hospital	Indus	Part	20			11	469
Florence Crittenton Home	Mat	NPA'ssn	15	13	17	5	19
Jewell Orphan's Home	Inst	Frat	40			4	329
Columbus 900 564—Franklin Florence Crittenton Home	Mat	NPA'ssn	70	24	62	2	105
Franklin County Home	Inst	County	125			121	140
Institution for Feeble-minded	MeDe	State	2 150			2 075	375
			Rated capacity 2 000				
Ohio Penitentiary Hospital	Inst	State	127			118	2 540
Corvington 1 907—Miami Corvington Hospital	Gen	Corp	6	1	6	1	79
Dayton 900 982—Montgomery Convalescent Home for Crippled Children	Orth	NPA'ssn	34			15	78
Delaware 8 610—Delaware Girls Industrial School	Inst	State	32			2	351
Euclid 12 701—Cuyahoga Ream Sanitarium	Conv	Corp	90		No data supplied		
Rose-Mary Home	Orth	Church	20			22	12
Fairfield 1 240—Creene Station Hospital	Cen	Army	25			2	66
Granville 1 461—Licking Whisler Hall Memorial Hosp	Inst	NPA'ssn	20			4	355
Greenfield 3 851—Highland Greenfield Hospital	Cen	NPA'ssn	16	3	5	7	198
Lancaster 18 716—Fairfield Boys Industrial School	Inst	State	100			70	1 001
Lebanon 3 779—Warren Blair Brothers Hospital	Gen	Part	8	3	25	5	255
Mansfield 33 525—Richland Ohio State Reformatory	Inst	State	91		No data supplied		
Thomas Sanatorium	Gen	Indiv	18			8	59
Marysville 3 639—Union Harmon Hospital (Ohio Reformatory for Women)	Inst	State	36	3	2	4	255
Mt Vernon 9 350—Knob Avalon Sanatorium	TB	Indiv	62			40	82
Munroe Falls 302—Summit Summit County Hospital	Inst	County	130			107	468
Napoleon 4 545—Henry S M Heller Mem Hosp	Gen	City	13	4	37	8	365
New London 1 527—Huron New London Hospital	Gen	NPA'ssn	9	3	16	4	174
Orient 2 511—Pekawav Institutions for Feeble-minded	MeDe	State	2 500			2 505	903
			Rated capacity 2 900				
Oxford 9 555—Butler Miami University Student Hospital	Inst	State	22			12	1 102
Reynoldsburg 562—Franklin Nightingale Cottage	TbChil	NPA'ssn	40			33	66
Springfield 68 743—Clark Ohio Rebekah Hospital	Inst	Frat	7			42	245
Rickly Memorial Hospital	Inst	Frat	252			235	252
State Soldiers Home—Erie Ohio Soldiers and Sailors Home Hospital	Inst	State	215			103	415
Tiffin 16 495—Seneca Kentucky Memorial Hosp	Inst	Frat	50			12	788
Toledo 900 718—Lucas Lucas County Hospital Annex	Chr	County	110			103	157
Municipal Hospital for Contagious Diseases	Iso	City	30			6	233
Toledo Society for Crippled Children	Orth	NPA'ssn	45			195	
Warrensville 1 507—Cuyahoga Warrensville Chronic Hospital	MentInst	City	170			161	463
Wickliffe 2 491—Lake Ridge-Cliff Sanitarium	N CM	Corp	110			92	70
Wooster 10 742—Wayne Hygeia Hall	Inst	NPA'ssn	25			3	345
Venia 10 505—Greene Ohio Soldiers and Sailors Orphans Home Hospital	Inst	State	63			25	1 325
Yellow Springs 1 427—Greene Antioch College Infirmary	Inst	NPA'ssn	10			3	400
Youngstown 1 0 002—Mahoning Youngstown Municipal Hospital	Ico	City	60			2	85
Summary for Ohio							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	185	44 780	35 518	418 298			
	65	9 071	7 626	22 292			
Totals	250	53 851	46 144	440 600			
Refused registration	29	753					

## OKLAHOMA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Ada 11 261—Pontotoc Ada Hospital	Gen	Corp	35	6	53	14	723
Breco's Memorial Hospital	Gen	NPA'ssn	25	2	67	7	448
Sugg Clinic and Hospital	Cen	Part	15	6	130	5	1 886
Valley View Hospital	Gen	NPA'ssn	50	10		Estab 1938	
Altus 8 439—Jackson City Hospital	Gen	City	25	2	29	4	250
Alva 5 121—Woods Alva General Hospital	Gen	City	24	4	88	20	946
Anadarko 5 096—Caddo Anadarko Hospital	Cen	Part	21	3	47	11	575
Ardmore 15 741—Carter Hardy Sanitarium	Gen	Indiv	44	8	103	20	1 098
Von Keller Hospital and Clinic	Cen	NPA'ssn	24	2	36	8	349
Bartlesville 14 763—Washington Washington County Memorial Hospital	Gen	County	50	10	211	2	1 043
Beaver 1 028—Beaver Beaver Hospital	Cen	Part	20	3	26	5	414
Blackwell 9 521—Kay Blackwell Hospital	Cen	NPA'ssn	35	3	55	7	287
Riverside Clinic Hospital	Gen	Part	14	4	25	10	100
Bristow 6 619—Creek Cowart Sisler Hospital	Cen	Part	18	5	39	5	308
Cherokee 2 936—Alfalfa Masonic Hospital	Gen	Frat	50	7	71	13	905
Chickasha 14 059—Grady Chickasha Hospital	Cen	Part	34	4	63	26	1 103
Cottage Hospital	Cen	Indiv	10	3	26	9	4 6
General Hospital	Cen	NPA'ssn	20	5	50	5	615
Claremore 3 720—Rogers Claremore Indian Hospital	Gen	IA	86	16	198	51	854
Clinton 7 512—Custer Clinton Indian Hospital	Gen	IA	30	5	28	17	502
Western Oklahoma Tubercularis Sanatorium	FB	State	299			244	496
Concho 290—Canadian Cheyenne and Arapaho Hospital	Cen	IA	46	8	51	28	696
Cordell 2 936—Washita Florence Hospital	Gen	Indiv	30	6	36	8	269
Cushing 9 301—Payne Masonic Hospital	Cen	Frat	30	6	76	20	774
Duncan 8 363—Stephens Patterson Hospital	Gen	Indiv	30	5	87	11	754
Weedn Hospital	Cen	Indiv	48	5	30	20	450
Durant 7 463—Bryan Coker Hospital	Cen	Indiv	10	2	20	5	297
Durant Hospital	Gen	Corp	2	2	67	12	646
Fevergreen Sanitarium	Gen	Indiv	21	3	24	8	252
Elk City 5 666—Beckham Elkhart Hospital	Cen	Indiv	22	3	53	13	758
El Reno 9 384—Canadian Catto Hospital	Gen	Indiv	16	3	21	6	214
El Reno Sanitarium	Gen	Corp	36	10	42	14	595
Enid 23 399—Garfield Baptist Hospital	Gen	Church	50	12	190	27	1 088
Enid General Hospital	Gen	NPA'ssn	90	10	125	57	1 769
St Mary's Enid Springs Hospital	Gen	Church	35	9	186	27	1 406
Frick 2 231—Beckham Frick Hospital	Cen	NPA'ssn	70	4	15	8	204
Ft Sill 5 587—Comanche Station Hospital	Gen	Army	450	8	117	252	6 284
Frederick 4 568—Tillman Frederick Clinic Hospital	Cen	Part	23	3	48	12	486
Spurgeon Arrington and Allen Hospital and Clinic	Gen	Corp	15	6	70	3	263
Grandfield 1 416—Tillman Grandfield Hospital	Gen	Indiv	21	5	96	4	100
Guthrie 9 582—Logan Cimarron Valley Wesley Hospital	Gen	NPA'ssn	75	5	70	17	637
Duke Sanitarium	N CM	Corp	25			17	122
Henryetta 7 694—Okmulgee Henryetta Hospital	Cen	Indiv	15	2	22	9	480
Hobart 4 952—Kiowa General Hospital	Gen	Part	21	5	160	9	753
Holdenville 7 965—Hughes Holdenville Hospital	Gen	Indiv	30	3	30	8	590
Hollis 2 914—Harmon Hollis Hospital	Cen	Indiv	15	3	29	7	600
Hominy 3 485—Osage Hominy City Hospital	Cen	Indiv	18	4	31	2	244
Lawton 12 121—Comanche Kiowa Indian Hospital	Cen	IA	160	16	204	109	2 770
Southwestern Hospital	Gen	Part	25	4	22	6	436
Mangum 4 806—Greer Border Hospital and Clinic	Gen	Part	50	6	No data supplied		
Marlow 3 044—Stephens Weedn Hospital	Cen	Indiv	25	4	No data supplied		
Maud 4 396—Seminole Maud Hospital	Gen	Indiv	18	4	25	8	256
McAlester 11 554—Pittsburg Albert Pike Hospital	Gen	Frat	63	6	63	26	1 182
St Mary's Infirmary	Gen	Church	20	6	33	8	381
Miami 8 064—Ottawa Miami Baptist Hospital	Gen	Church	40	10	60	12	854
Muskogee 22 026—Muskogee Muskogee Provident Hospital (col)	Cen	City	20	2	10	8	124
Oklahoma Baptist Hospital	Cen	Church	85	11	250	47	1 714
Veterans Admin Facility	Cen	Vet	405			279	3 716

Key to symbols and abbreviations is on page 986

## OKLAHOMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Norman 9 603—Cleveland Central Oklahoma State Hospital	Ment	State	2 475			2 496	986
		Rated capacity	1 920				
Oklahoma 4 602—Oklfuskee Clinic Hospital	Gen	Part	10	3	33	4	320
Oklahoma City 185 389—Oklahoma Farm Sanatorium	TB	Indiv	20			15	92
Great Western Hospital (col)	Gen	Corp	26	2		18	106
Oklahoma City General Hospital	Gen	Corp	100	12	209	70	3 483
Polyclinic Hospital	Gen	Indiv	70	6	90	48	2 613
Reconstruction Hospital and McBride Clinic	Orth	Corp	20			8	371
St Anthony Hospital	Gen	Church	300	40	1 297	267	9 076
Samaritan Hospital	Gen	Corp	40	10	221	18	1 174
State University and Crippled Childrens Hospital	Gen	State	418	18	505	382	6 455
Wesley Hospital	Gen	Part	130	20	614	80	4 332
Oklmulgee 17 097—Oklmulgee Oklahoma City Colored Hospital	Gen	City	20	1	5	6	160
Oklmulgee City Hospital	Gen	City	50	7	106	14	909
Pauls Valley 4 250—Garvin Lindsey Johnson Shirley Hospital	Gen	Part	23	7	72	6	397
Pawhuska 5 931—Osage Osage County Hospital	Gen	County	40	3	68		507
Pawhuska Municipal Hosp	Gen	City	40				
Pawnee 2 062—Pawnee Pawnee Ponca Hospital	Gen	IA	48	6	178	32	1 064
Picher 7 773—Ottawa American Hospital	Gen	Indiv	40	3	12	5	246
Picher Hospital	Gen	Part	20	4	16	9	325
Ponca City 16 136—Kay Ponca City Hospital	Gen	Church	40	12	302	40	1 943
Poteau 3 169—Le Flore Woodson Hospital	Gen	Indiv	20	2	15	10	200
Prague 1 299—Lincoln Rollins Hospital	Gen	Indiv	10	3	26	4	238
Seminole 14 409—Seminole Harber Hospital	Gen	Corp	19	2	100	12	873
Shattuck, 1 490—Ellis Shattuck Hospital	Gen	Indiv	48	6	174	14	999
Shawnee 23 283—Pottawatomie A O H Hospital	Gen	Part	20	5	138	11	710
Shawnee Indian Sanatorium	TB	IA	150			126	134
Shawnee Municipal Hospital	Gen	City	70	8	103	22	1 016
Sulphur 4 242—Murray Soldiers Tubercular Sanat	TB	State	133			123	730
Sulphur Clinic	Gen	Part	12	4	121	4	217
Supply 230—Woodward Western Oklahoma Hospital	Ment	State	1 427			1 402	530
		Rated capacity	1 300				
Taft 600—Muskogee State Hospital for Negro Insane	Ment	State	770			603	281
		Rated capacity	900				
Tallhina 1 032—Le Flore Choctaw Chickasaw Sanat	TB	IA	70			70	188
Eastern Oklahoma State Tuberculosis Sanatorium	TB	State	300			293	623
Tonkawa 3 311—Kay Tonkawa Hospital	Gen	Indiv	20	4	21	2	160
Tulsa 141 208—Tulsa Flower Hospital	Gen	Corp	30	12	363	12	870
Morningside Hospital	Gen	Corp	275	30	446	97	3 078
Oakwood Sanatorium	N & M	Corp	0			25	310
St John's Hospital	Gen	Church	200	35	709	148	5 640
Stier Hospital	G & Orth	Indiv	160	10	124	47	1 331
Vinita 4 265—Craig Eastern Oklahoma Hospital	Ment	State	2 370			2 624	400
		Rated capacity	1 840				
Vinita Hospital	Gen	Corp	14	3	40	7	380
Waurika 2 368—Jefferson Waurika Hospital	Gen	Corp	20	2	32	8	439
Wewoka 10 401—Seminole Knight Hospital	Gen	Corp	20	4	42	8	761
Wewoka Hospital	Gen	Part	20	4	30	8	337
Woodward 5 006—Woodward Woodward General Hospital	Gen	Indiv	40	4	No data supplied		
Related Institutions							
Chillico 200—Kay Chillico Indian School Hosp	Gen	IA	47	1	6	2	141
Durant 7 462—Bryan Bryan County Hospital	Gen	Indiv	8	1	5	2	86
El Reno 9 384—Canadian U S Southwestern Reformatory	In t	USPHS	40			29	773
Enid 2 270—Garfield Northern Oklahoma Hosp	McDe	State	1 020			1 018	101
		Rated capacity	800				
Fairfax 2 134—Osage Fairfax Hospital	Gen	Indiv	11	3	0	4	207
Ft Reno (El Reno P O) Station Hospital	Gen	Army	12			1	0
Hobart 4 052—Kiowa Hobart Hospital	Gen	Corp	20	4	81	8	40
Kingfisher 2 726—Kingfisher Kingfisher Hospital	Gen	Indiv	8	2	20	2	271
Lawton 12 151—Comanche Angus Hospital	Gen	Part	10	4	40	4	201

## OKLAHOMA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
McAlester 11 804—Pittsburg Oklahoma State Prison Hospital	Inst	State	68			47	80
Okeene 1 035—Blaine Okeene Hospital	Gen	Indiv	11	3	28	3	79
Oklahoma City 185 389—Oklahoma Home of Redeeming Love	Mat	Church	22	30	160	9	47
Ryan 1 208—Jefferson Ryan Hospital	Gen	Indiv	10	2	0	8	0
Stillwater 7 016—Payne Agriculture and Mechanical College Infirmary	Inst	State	50			9	117
Tablequah 2 940—Cherokee Sequoyah Training School Hospital	Inst	IA	19			6	30
Tulsa 141 208—Tulsa Municipal Hospital No 2 (col)	Gen	County	50	6	51	10	0
Tulsa General Hospital	Gen	Corp	60	12	60	10	0
Tulsa Junior League Home for Convalescent Crippled Children	Orth	N P Asn	30			0	11
Watonga 2 228—Blaine Watonga Hospital	Gen	Indiv	15			43	6 45
Weatherford 2 417—Custer Dr D Gades Sanitarium	Gen	Indiv	20	4	7	5	16
Summary for Oklahoma							
Hospitals and Sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	103	13 713	11 006	104 011			
	20	1 002	1 114	1 400			
Totals	123	14 715	12 120	111 411			
Refused registration	21	427					

## OREGON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Albany 5 320—Linn Albany General Hospital	Gen	N P Asn	50	8	113	0	81
Ashland 4 544—Jackson Community Hospital	Gen	City	21	6	20	8	0
Astoria 10 349—Clatsop Columbia Hospital	Gen	Church	91	13	100	5	07
St Mary's Hospital	Gen	Church	100	15	77	0	140
Baker 7 808—Baker Baker General Hospital	Gen	Corp	20	4	No data supplied		
St Elizabeth Hospital	Gen	Church	100	18	101	08	007
Bend 8 648—Deschutes St Charles Hospital	Gen	Church	45	6	160	03	100
Burns 2 099—Harney Valley View Hospital	Gen	Indiv	18	4	38	11	00
Corvallis 7 080—Benton Corvallis General Hospital	Gen	N P Asn	38	6	154	01	0
Dallas 2 975—Polk Dallas Hospital	Gen	Corp	24	4	42	6	00
Enterprise 1 379—Wallowa Enterprise Hospital	Gen	Corp	15	2	15	4	100
Eugene 18 901—Lane Eugene Hospital and Clinic	Gen	Part	70	8	148	51	100
Sacred Heart General Hosp	Gen	Church	100	18	008	61	000
Grants Pass 4 666—Josephine Josephine County General Hospital	Gen	County	30	9	80	00	003
Hood River 2 707—Hood River Hood River Hospital	Gen	N P Asn	40	10	100	20	110
Klamath Agency 163—Klamath Klamath Indian Hospital	Gen	IA	20	8	58	10	41
Klamath Falls 16 092—Klamath Hillsdale Hospital	Gen	Corp	47	12	207	40	001
Klamath Valley Hospital	Gen	Corp	00	10	208	00	103
Lebanon 1 801—Linn Lebanon General Hospital	Gen	N P Asn	20	6	96	10	000
McMinnville 2 917—Yamhill McMinnville Hospital	Gen	Corp	36	6	103	31	100
Medford 11 007—Jackson Sacred Heart Hospital	Gen	Church	70	8	169	48	100
Milwaukie 1 767—Clackamas Portland Open Air Sanat	TB	N P Asn	00			29	100
Myrtle Point 1 362—Coos Mast and Wilson Hospital	Gen	Indiv	38	6	45	21	0
Newberg 2 901—Yamhill Willamette Hospital	Gen	Corp	18	4	41	6	00
North Bend, 4 012—Coos Kelzer Brothers Hospital	Gen	Corp	68	10	No data supplied		
Mercy Hospital	Gen	Church	00	4	02	01	00
Ontario 1 941—Malheur Holy Rosary Hospital	Gen	Church	40	6	40	29	000
Oregon City 5 761—Clackamas Hutchin on General Hosp	Gen	Indiv	31	7	101	1	00
Oregon City Hospital	Gen	Corp	02	8	107	41	100
Pendleton 6 621—Umatilla Eastern Oregon State Hosp	Ment	State	1 200			1 000	000
		Rated capacity	1 300				
St Anthony's Hospital	Gen	Church	70	12	104	00	100
Portland 201 010—Multnomah Doernbecher Memorial Hospital for Children	Chil	State	00	00	10	00	000
Finanuel Hospital	Gen	Church	00	00	10	00	000

Key to symbols and abbreviations is on page 986

OREGON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Good Samaritan Hospital*o	Gen	Church	316	34	721	270	11 149
Juvenile Hospital for Girls VenMat	NPAssn		100	8	20	78	121
Morningside Hospital	Ment	Fed	31a			300	60
Multnomah Hospital*+o	Gen	County	300	22	598	260	4 516
Portland Convalescent Hosp	Conv	Indiv	2a			14	186
Portland Medical Hospital	Gen	Corp	64			2a	599
Portland Sanitarium and Hospital*o	Gen	Church	111	24	634	96	5 112
Dr Robert C Coffey Clinic and Hospital	Gen	Corp	100	6			
St Vincent's Hospital*+o	Gen	Church	384	56	78a	375	10 406
Shriners Hospital for Crip-pled Children*o	Orth	Frat	50			50	235
Theo B Wilcox Memorial Hospital	Unit of Good Samaritan Hospital					344	2 238
Veterans Admin Facility	Gen	Vet	353			8	66
Waverleigh Sanatorium	N&M	Part	12				
Roseburg 4362—Douglas	Gen	Church	50	7	160	16	900
Mersey Hospital	Gen	Vet	191			7a	903
Veterans Admin Facility	Gen	Vet					
St Helens 3991—Columbia	Gen	Corp	19	6	36	9	679
St Helens General Hospital	Gen	Corp					
Salem 9696—Marion	Ment	State	2 792			2 49a	500
Oregon State Hospital	Rated capacity		2 400				
Oregon State Tuberculosis Hospital	TB	State	32a			294	2a3
Salem Deaconess Hospital	Cen	Church	100	10	268	94	2 000
Salem General Hospital	Gen	NPAssn	64	14	241	37	1 716
Silverton 2463—Marion	Gen	Corp	22	7	116	8	400
The Dalles 5883—Wasco	Gen	Corp					
Eastern Oregon State Tu-berculosis Hospital*o	TB	State	150			147	113
Mad Columbia Hospital*o	Cen	Indiv	22	6	33	14	610
The Dalles Hospital*o	Gen	Corp	7a	8	1a4	34	1 970
Tillamook 2549—Tillamook	Gen	Indiv	8a	8	59	16	738
Charlton Hospital	Gen	Indiv					
Toledo 2137—Lincoln	Gen	Part	2a	4	87	14	46a
Troutdale 22—Multnomah	TB	County	41			39	58
Multnomah County Tuber-culosis Pavilion							
Warm Springs 50—Jefferson	Cen	IA	2a	6			Estab 1937
Warm Springs Hospital							
Woodburn 167a—Marion	Gen	Indiv	10	4	No data supplied		
Woodburn Hospital							
Related Institutions							
Chemawa 67a—Marion	Gen	IA	50	3	9	18	531
Salem Indian School Hosp	Gen	IA					
Coquille 7737—Coos	Cen	Part	30	6	78	15	5 9
Coquille Hospital							
Corvallis 778a—Benton	Inst	State	30			9	69a
Oregon State Agricultural College Hospital							
Lakeview 1799—Lake	Cen	NPAssn	12	4	19	9	70a
Lakeview Hospital							
Portland 3018a—Multnomah	Mat	NPAssn	70	12	36	12	4a
E Henry Wemmo White Shield Isolation Hospital	Iso	City	60			18	342
Salvation Army White Shield Home	Mat	Church	30	6	86	29	132
Prairie City 4a—Grant	Gen	Indiv	12	5			
Grant County Hospital							
Salem 2696—Marion	MeDe	State	917			967	10a
Oregon Fairview Home	Rated capacity		1 000				
Oregon State Penitentiary Hospital	Inst	State	30			15	497
Oregon State School for the Deaf	Inst	State	11			1	268
Waldport 36a—Lincoln	Gen	Indiv	10	4	92	2	78
Waldport Community Hosp							
Summary for Oregon							
Hospitals and sanatoriums			60	8 99a		7 639	90 072
Related institutions			12	1 30a		1 097	3 863
Totals			72	10 298		8 736	93 93a
Refu ed registration			14	34a			

PENNSYLVANIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Abington 3900—Montgomery	Gen	NPAssn	2a1	51	733	194	6 126
Abington Memorial Hosp *+o							
Allentown 9233—Lehigh	Cen	NPAssn	300	25	636	2a5	7 411
Allentown Hospital*o	Ment	State	1 367			1 617	26a
Allentown State Hosp +o	Rated capacity		1 494				
Baer Hospital	Gen	Indiv	2a	10		132	
Sacred Heart Hospital*o	Gen	Church	260	2a	546	171	4 46
Menwood 400—Union	TB	NPAssn	10a			92	2a0
Devitt's Camp							
Altoona 8704a—Blair	Gen	NPAssn	162	18	389	95	3 048
Altoona Hospital*o							

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Mercy Hospital*o	Gen	NPAssn	127	17	544	110	3 585
Ambler 3944—Montgomery	Gen	NPAssn					
Dufur Hospital	N&M	Indiv	50			43	76
Ashland 7164—Schuylkill	Gen	State	150	2a	4a2	149	4 570
Ashland State Hospital*o							
Aspinwall (Pittsburgh P O) 426a—Allegheny	Gen	State					
Veterans Admin Facility	G&TB	Vet	50a			496	2 3a2
Beaver Falls 17147—Beaver	Gen	Church	49	9	188	42	1 276
Providence Hospital	Gen	Church					
Bedford 2933—Bedford	Gen	Indiv	17	3	12	8	2a2
Timmins Hospital							
Bellefonte 4304—Center	Gen	NPAssn	53	16	280	46	1 343
Center County Hospital							
Bellevue 102a2—Allegheny	Gen	NPAssn	104	14	286	56	2 024
Suburban General Hospital*o	Gen	NPAssn					
Berwick 12660—Columbia	Cen	NPAssn	52	10	13a	2a	1 019
Berwick Hospital							
Bethlehem 57892—Northampton	Gen	NPAssn	102	23	437	142	4 946
St Luke's Hospital*+o							
Bloomsburg 9093—Columbia	Gen	NPAssn	117	18	240	69	2 290
Bloomsburg Hospital*o							
Blossburg 1696—Tioga	Gen	State	90	9	180	75	2 045
Blossburg State Hospital							
Bradock 19329—Allegheny	Gen	NPAssn	126	16	519	8a	2 904
Bradock General Hosp *o							
Bradford 19306—McKean	Gen	NPAssn	107	23	410	56	2 151
Bradford Hospital*o							
Bristol 11799—Bucks	Gen	Indiv	18	6	83	10	353
Dr Wagners Private Hosp							
Brookville 4387—Jefferson	Gen	NPAssn	34	7	36	31	720
Brookville Hospital							
Brownsville 2589—Fayette	Gen	NPAssn	90	10	146	58	1 712
Brownsville General Hosp *o							
Bryn Mawr 3056—Montgomery	Gen	NPAssn	240	24	546	144	5 127
Bryn Mawr Hospital*o							
Butler 23568—Butler	Gen	NPAssn	108	20	2a1	56	2 218
Butler County Memorial Hospital*o							
Canonsburg 12538—Washington	Gen	NPAssn	66	14	2a4	44	1 673
Canonsburg General Hosp *o							
Carbondale 20061—Lackawanna	Gen	NPAssn	58	12	147	37	1 409
Carbondale General Hosp Gen	Church		88	10	138	43	1 56a
St Joseph's Hospital*o							
Carlisle 12596—Cumberland	Gen	NPAssn	77	18	2a2	64	1 947
Carlisle Hospital	Gen	Army	50	2	19	46	1 018
Station Hospital							
Chambersburg 13788—Franklin	Gen	NPAssn	77	12	No data supplied		
Chambersburg Hospital							
Chester 59164—Delaware	Gen	NPAssn	2a0	3a	63a	130	4 409
Chester Hospital*o							
J Lewis Crozer Home for Incurables and Homeo-pathic Hospital	Gen	NPAssn	8a	15	269	23	1 197
Clarks Summit 2604—Lackawanna	Ment	City	9a0			801	2a4
Hillside Home and Hospital for Mental Diseases							
Clearfield 9221—Clearfield	Gen	NPAssn	110	17	188	75	3 687
Clearfield Hospital*o							
Clifton Heights 5037—Delaware	N&M	Indiv	4a			40	81
Burn Brae Hospital							
Coaldale 6921—Schuylkill	Gen	State	104	18	271	84	2 129
Coaldale State Hospital							
Coatesville 14582—Chester	Gen	NPAssn	1a4	10	178	61	1 78a
Coatesville Hospital*o	Ment	Vet				1 9a2	2a3
Veterans Admin Facility							
Columbia 11349—Lancaster	Cen	NPAssn	4a	10	74	18	42a
Columbia Hospital							
Colver 2060—Cambria	Gen	NPAssn	19	4	No data supplied		
Colver Hospital							
Conduence 985—Somerset	Gen	Indiv	12	3	26	7	272
Conduence Hospital							
Conneville 13290—Fayette	Cen	State	93	15	3a7	68	1 9a3
Connellsville State Hospital							
Corry 7152—Erie	Gen	NPAssn	40	8	178	16	1 176
Corry Hospital							
Coudersport 2740—Potter	Gen	NPAssn	27	4	44	12	419
Coudersport General Hosp							
Danville 711a—Montour	Ment	State	1 918			1 949	421
Danville State Hospital*o	Rated capacity		1 947				
Geo F Gelsinger Memorial Hospital*+o	Gen	NPAssn	161	26	443	117	5 091
Darby 9899—Delaware	Gen	Church	200	48	770	120	4 26a
Fitzgerald Mercy Hospital* Gen							
Diamond 1200—Allegheny	N&M	NPAssn	1 000			1 176	233
Diamond Hospital							
Drexel Hill 1119—Delaware	Gen	NPAssn	56	14	319	42	1 942
Delaware County Hospital							
Du Bois 11397—Clearfield	Gen	Church	50	7	96	2a	904
Du Bois Hospital							
Maple Avenue Hospital	Gen	NPAssn	70	7	122	2a	1 151
Eagleview 184—Montgomery							
Engleview Sanatorium for Consumptives*o	TB	NPAssn	188			176	191
Easton 34468—Northampton	Gen	NPAssn	40	10	1a5	23	962
Betts' Private Hospital	Gen	NPAssn	200	20	446	136	4 3a
Easton Hospital*o							
Easton Sanitarium	N&M	Indiv	30			16	72
East Stroudburg 6099—Monroe	Gen	NPAssn	47	8	145	31	1 1a6
General Hospital of Monroe County							
Elizabethtown 3940—Lancaster	Gen	Frat	16a			151	615
Philadelphia Freemasons Me-morial Hospital							

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
State Hospital for Crippled Children	Orth	State	125			122	238
Ellwood City 1232—Lawrence	Gen	NPAsen	52	12	209	38	902
Ellwood City Hospital	Gen	NPAsen	52	12	209	38	902
Eric 115 967—Eric	Gen	NPAsen	52	12	209	38	902
Eric County Tuberculosis Hospital	TB	County	60				
Hamot Hospital*	Gen	NPAsen	224	31	903	105	1937
St Vincent's Hospital*	Gen	NPAsen	180	38	701	208	6147
Zem Zem Hospital for Crippled Children	Orth	Frat	50			35	53
Everett 1874—Bedford	Gen	Indiv	25	5	44	11	340
Everett Hospital	Gen	Indiv	25	5	44	11	340
Franklin 1024—Venango	Gen	NPAsen	47	10	111	32	1212
Franklin Hospital	Gen	NPAsen	47	10	111	32	1212
Gettysburg 184—Adam	Gen	NPAsen	44	6	178	33	1244
Annie M Warner Hospital	Gen	NPAsen	44	6	178	33	1244
Gladwyne 1,236—Montgomery	N&M	Indiv	82			72	117
Gladwyne Colony	N&M	Indiv	82			72	117
Greensburg 16 508—Westmoreland	Gen	NPAsen	140	12	593	109	3798
Westmoreland Hospital	Gen	NPAsen	140	12	593	109	3798
Greenville 8,628—Mercer	Gen	NPAsen	51	12	108	23	1189
Greenville Hospital	Gen	NPAsen	51	12	108	23	1189
Grove City 6106—Mercer	Gen	NPAsen	26	5	69	11	401
Grove City Hospital	Gen	NPAsen	26	5	69	11	401
Hamburg 3 637—Berks	Gen	NPAsen	26	5	69	11	401
Hamburg State Sanatorium for Tuberculosis	TB	State	340			520	630
Hanover, 11 800—York	Gen	NPAsen	50	10	311	36	1,208
Hanover General Hospital	Gen	NPAsen	50	10	311	36	1,208
Harrisburg 80 439—Dauphin	Gen	NPAsen	239	20	637	206	6308
Harrisburg Hospital*	Gen	NPAsen	239	20	637	206	6308
Harrisburg Polyclinic Hospital*	Gen	NPAsen	100	32	514	144	3744
Harrisburg State Hospital	Ment	State	1976			2030	216
Rated capacity 1921	Gen	Indiv	27	6	80	20	590
Keystone Hospital	Gen	Indiv	27	6	80	20	590
Hazleton 36 760—Luzerne	Mat	Part	16	16	300	10	300
Corrigan Maternity Hosp	Gen	State	141	14	439	134	5617
Hazleton State Hospital	Gen	State	141	14	439	134	5617
Hollidaysburg 5 969—Blair	Gen	NPAsen	300			318	114
Blair County Hospital for Mental Diseases	Ment	County	300			318	114
Homestead 20 141—Allegheny	Gen	Corp	106	20	400	68	2160
Homestead Hospital	Gen	Corp	106	20	400	68	2160
Honesdale 5 400—Wayne	Gen	NPAsen	29	7	08	10	512
Wayne County Memorial Hospital	Gen	NPAsen	29	7	08	10	512
Huntingdon 7 008—Huntingdon	Gen	NPAsen	70	14	220	00	1,888
J C Blair Memorial Hosp	Gen	NPAsen	70	14	220	00	1,888
Indiana 9 000—Indiana	Gen	NPAsen	145	15	160	106	3,062
Indiana Hospital	Gen	NPAsen	145	15	160	106	3,062
Jersey Shore 5 781—Lycoming	Gen	NPAsen	20	3	37	5	420
Jersey Shore Hospital	Gen	NPAsen	20	3	37	5	420
Sanford Hospital	Gen	Indiv	20	3	27	8	323
Johnstown 66 903—Cambria	Gen	NPAsen	300	30	489	247	6074
Coneaugh Valley Memorial Hospital	Gen	NPAsen	300	30	489	247	6074
Lee Homeopathic Hospital	Gen	NPAsen	04	10	246	47	1418
Mendenhall Maternity Hosp	Indiv	Indiv	18	16	144	6	152
Mercy Hospital	Gen	Church	80	14	418	73	2218
Kane 6232—McKean	Gen	NPAsen	07	12	134	43	1711
Community Hospital	Gen	NPAsen	07	12	134	43	1711
Kane Summit Hospital	Gen	NPAsen	30	0	63	14	461
Kingston, 21 600—Luzerne	Gen	NPAsen	120	10	306	92	3218
Nesbitt Memorial Hosp*	Gen	NPAsen	120	10	306	92	3218
Kittanning 7 808—Armstrong	Gen	NPAsen	66	4	110	42	1504
Armstrong County Hospital	Gen	NPAsen	66	4	110	42	1504
Lancaster 09 949—Lancaster	Gen	NPAsen	237	40	751	192	6122
Lancaster General Hosp*	Gen	NPAsen	237	40	751	192	6122
Rosenberg Sanatorium	TB	CyCo	07			03	99
St Joseph's Hospital*	Gen	Church	100	32	368	115	4174
Lansdale 8 300—Montgomery	Gen	NPAsen	28	12	08	13	474
Film Terrace Hospital	Gen	NPAsen	28	12	08	13	474
Latrobe 10 644—Westmoreland	Gen	NPAsen	75	10	300	02	1881
Latrobe Hospital	Gen	NPAsen	75	10	300	02	1881
Lebanon 25 061—Lebanon	Gen	NPAsen	90	12	242	69	2290
Cood Samanitan Hospital	Gen	NPAsen	90	12	242	69	2290
Lebanon Sanatorium	Gen	Corp	25	6	67	20	606
Leetsdale 2 774—Allegheny	Orth	NPAsen	100			93	170
D T Watson Home for Crippled Children	Orth	NPAsen	100			93	170
Lewisburg 3 308—Union	Gen	Church	26	7	108	16	618
Frankelton Hospital	Gen	Church	26	7	108	16	618
U S Public Health Service Hospital	Gen	USPHS	84			41	1600
Lewistown 13 307—Mifflin	Gen	NPAsen	89	7	201	66	2264
Lewistown Hospital	Gen	NPAsen	89	7	201	66	2264
Lock Haven 9 608—Clinton	Gen	NPAsen	68	10	220	44	1240
Lock Haven Hospital	Gen	NPAsen	68	10	220	44	1240
Teah Private Hospital	Gen	Indiv	16	4	22	6	224
Lock 10 4 618—Washington	Gen	NPAsen	80	20	324	00	1924
Charleroi Mone sen Hospital	Gen	NPAsen	80	20	324	00	1924
Mayview 420—Allegheny	Gen	City	007	4	6	640	1105
Pittsburgh City Home and Hospitals	Gen	City	007	4	6	640	1105
Pittsburgh City Home and Hospitals	N&M	City	2718			2774	670
McKeessport 54 632—Allegheny	Gen	NPAsen	243	40	1004	172	007
McKeessport Hospital*	Gen	NPAsen	243	40	1004	172	007
McKeess Rock 10 116—Allegheny	Gen	NPAsen	53	17	220	48	1,001
Ohio Valley General Hosp	Gen	NPAsen	53	17	220	48	1,001

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Meadville 16 698—Crawford	Gen	NPAsen	90	14	230	00	1000
Meadville City Hospital	Gen	NPAsen	90	14	230	00	1000
Spencer Hospital	Gen	NPAsen	107	13	230	00	1000
Media 5 302—Delaware	Gen	Indiv	27	4	30	10	000
Media Hospital	Gen	Indiv	27	4	30	10	000
Mercer 2 120—Mercer	Gen	Corp	50	4	00	00	000
Mercer Cottage Hospital	Gen	Corp	50	4	00	00	000
Mercer Sanatorium	N&M	Part	50	4	00	00	000
Meyersdale 3 000—Somerset	Gen	Indiv	14	5	04	00	000
Hazel McGilvery Hospital	Gen	Indiv	14	5	04	00	000
Meyersdale Wenzel Hospital	Gen	Indiv	12	3	00	00	000
Monaca, 4 641—Beaver	Gen	Indiv	12	3	00	00	000
Beaver County Sanatorium	TB	County	62			00	000
Monessen 20 268—Westmoreland	Gen	NPAsen	62	10	183	40	1000
Gemmell Hospital	FAT	Part	12			00	000
Monongahela 8 675—Washington	Gen	NPAsen	66	8	100	00	1,100
Memorial Hospital	Gen	NPAsen	66	8	100	00	1,100
Mt Pleasant 5 869—Westmoreland	Gen	NPAsen	62	10	183	40	1000
Henry Clay Frick Memorial Hospital	Gen	NPAsen	62	10	183	40	1000
Nanticoke 26 043—Luzerne	Gen	NPAsen	62	10	183	40	1000
Nanticoke State Hospital	Gen	NPAsen	62	10	183	40	1000
New Brighton 9 900—Beaver	Gen	State	120	10	200	84	0000
Beaver Valley General Hospital	Gen	NPAsen	00	10	140	41	1000
New Castle 48 674—Lawrence	Gen	NPAsen	101	21	446	00	0000
Jameson Memorial Hosp	Gen	NPAsen	101	21	446	00	0000
New Castle Hospital	Gen	Church	100	20	302	00	0000
New Kensington, 16 762—Westmoreland	Gen	NPAsen	86	12	379	00	0000
Citizens General Hospital	Gen	NPAsen	86	12	379	00	0000
Norristown 30 803—Montgomery	Gen	NPAsen	90	20	312	61	0000
Montgomery Hospital*	Gen	NPAsen	90	20	312	61	0000
Norristown State Hospital*	Ment	State	3438			3600	310
Rated capacity 3407	Gen	Corp	30	10	200	18	000
Riverview Hospital	Gen	Church	40	11	220	20	1,000
Sacred Heart Hospital	Gen	Church	40	11	220	20	1,000
Northampton 9 839—Northampton	Gen	Indiv	32	3	10	20	000
Haff Hospital	Gen	Indiv	32	3	10	20	000
Oil City 22 070—Venango	Gen	NPAsen	00	20	317	11	000
Grand View Institution	TB	NPAsen	00	20	317	11	000
Oil City General Hospital	Gen	NPAsen	00	20	317	11	000
Palmerton 7 678—Carbon	Gen	NPAsen	07	8	183	00	1000
Palmerton Hospital	Gen	NPAsen	07	8	183	00	1000
Peckville 3 915—Lackawanna	Gen	NPAsen	62	8	269	00	1700
Mid Valley Hospital	Gen	NPAsen	62	8	269	00	1700
Philadelphia 19 001—Philadelphia	Gen	NPAsen	39	3	48	18	000
American Hospital for Diseases of the Stomach	Gen	NPAsen	39	3	48	18	000
American Oncologic Hosp	ShCa	NPAsen	45			00	000
Anderson Hospital	Gen	Corp	76	26	232	21	0000
Broad Street Hospital	Gen	NPAsen	80	30	200	00	1,000
Buckman's Sanatorium	N&M	Indiv	20			10	000
Chestnut Hill Hospital*	Gen	NPAsen	80	20	300	77	1000
Children's Heart Hospital	Card	NPAsen	60			00	000
Children's Hospital*	Chil	NPAsen	134			00	1000
Children's Hospital of the Mary J Drézel Home*	Chil	Church	03			00	000
Fairmount Farm	N&M	Corp	44			00	000
Frankford Hospital*	Gen	NPAsen	119	23	465	87	000
Frederick Douglass Memorial Hospital (col)	Gen	NPAsen	80	6	72	00	000
Friends Hospital	N&M	NPAsen	106			139	100
Garretson Hospital	N&M	NPAsen	106			139	100
Germanatoun Dispensary and Hospital*	Gen	NPAsen	340	06	1289	040	7700
Graduate Hospital of the University of Pennsylvania	Gen	NPAsen	404			010	0000
Hahnemann Hospital*	Gen	NPAsen	515	77	1377	010	1000
Home for Consumptives	TB	Church	104			00	000
Hospital of the Protestant Episcopal Church*	Gen	Church	48	48	1000	004	0000
Hospital of the University of Pennsylvania*	Gen	State	007	41	1010	008	11000
Hospital of the Woman's Medical College*	Gen	NPAsen	102	21	407	00	000
Institute of the Pennsylvania Hospital	N&M	NPAsen	60			00	000
Jeans Hospital*	Ca	NPAsen	70			00	000
Jefferson Medical College	Gen	NPAsen	631	7	000	4	1000
Jewish Hospital*	Gen	NPAsen	400	70	1000	004	0000
Joseph Price Memorial Hospital	Gen	NPAsen	60	10	00	17	000
Kensington Hospital for Women*	CynMat	NPAsen	00	20	000	00	000
Lankenau Hospital*	Gen	NPAsen	001	00	000	100	000
Lying In Hospital	Gen	NPAsen	71	10	247	00	1000
Memorial Hospital	Gen	NPAsen	100	10	200	74	2000
Mercy Hospital (col)*	Gen	NPAsen	100	10	200	74	2000
Methodist Episcopal Hospital*	Gen	Church	160	20	000	11	0000
Misericordia Hospital*	Gen	Church	120	30	000	10	0000
Mt Sinai Hospital*	Gen	NPAsen	271	00	100	00	0000
National Stomach Hospital	Gen	NPAsen	40	3	00	00	0000
Northeastern Hospital*	Gen	NPAsen	67	10	40	00	0000
Northern Liberties Hospital	Gen	NPAsen	00	11	00	00	0000
Northwestern General Hospital	Gen	NPAsen	400	100	240	00	0000
Pennsylvania Hospital*	Gen	NPAsen	400	100	240	00	0000
Pennsylvania Hospital De	Gen	NPAsen	400	100	240	00	0000
Partment for Mental and Nervous Diseases	N&M	NPAsen	22			00	0000
Philadelphia General Hospital*	Gen	City	2040	60	1000	00	0000

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Philadelphia Hospital for Contagious Diseases	Iso	City	1 000			390	5 390
Philadelphia Hospital for Mental Diseases	N&M	City	5 300			5 301	594
Philadelphia Italian Hosp	Gen	NPAsn	40	12	11	7	203
Philadelphia Orthopaedic Hospital and Infirmary for Nervous Diseases	Orth & Neur	NPAsn	140			54	512
Presbyterian Hospital	Gen	Church	314	42	499	208	5 165
Preston Retreat	Mat	NPAsn	50	30	380	23	400
Rush Hospital for Consumption and Allied Diseases	TB	NPAsn	161			98	339
St Agnes Hospital	Gen	Church	346	60	1 205	284	7 166
St Christopher's Hospital for Children	Chil	NPAsn	70			55	1 914
St Joseph's Hospital	Gen	Church	160	20	464	120	3 163
St Luke's and Children's Hospital	Gen	NPAsn	219	40	809	142	5 520
St Mary's Hospital	Gen	Church	200	44	690	123	4 429
St Vincent's Hospital for Women and Children	Gen	Church	81	24	378	41	621
Shriners Hospital for Crippled Children	Orth	Frat	109			103	198
Skin and Cancer Hospital	StCa	NPAsn	31			27	173
Stetson Hospital	Gen	NPAsn	62	10	117	30	1 381
Temple University Hosp	Gen	NPAsn	309	41	999	320	9 681
U S Naval Hospital	Gen	Navy	600			591	6 009
Urologic Clinic	Urol	Part	15			8	200
Wills Hospital	Eye	NPAsn	200			120	3 800
Woman's Hospital	Gen	NPAsn	109	41	871	76	3 520
Women's Homeopathic Hospital	Gen	NPAsn	160	40	431	73	3 018
Phillipsburg 3 600—Centre							
Dr McGirk Sanitarium	Gen	Indiv	20	6	22	4	180
Phillipsburg State Hospital	Gen	State	100	12	301	89	2 770
Phoenixville 12 000—Chester							
Phoenixville Hospital	Gen	NPAsn	60	9	105	30	982
Pittsburgh 669,817—Allegheny							
Allegheny General Hosp	Gen	NPAsn	538	54	724	336	8 233
Belvedere General Hospital	Gen	NPAsn	40	10	109	15	610
Children's Hospital	Chil	NPAsn	190			109	3 212
Elizabeth Steel Magee Hospital	Gen	NPAsn	208	112	2 374	202	7 500
Eye and Ear Hospital	ENT	NPAsn	101			68	4 340
Haddon Maternity Hospital	Mat	Corp	20	15	211	8	040
Homeopathic Medical and Surgical Hospital	Gen	NPAsn	235	40	761	172	5 136
Leech Farm Sanatorium	TB	City	290			286	387
Mersey Hospital	Gen	Church	672	48	697	570	12 412
Montefiore Hospital	Gen	NPAsn	198	32	781	200	6 479
Municipal Hospital for Contagious Diseases	Iso	City	150			53	769
Passavant Hospital	Gen	Church	116	24	260	79	2 819
Pittsburgh Hospital	Gen	NPAsn	184	24	596	147	4 168
Presbyterian Hospital	Gen	NPAsn	140			41	98 2 708
Roscha Foundling and Maternity Hospital	MatCh	NPAsn	154	16	243	122	600
St Francis Hospital	Gen	Church	600	40	790	501	10 409
St John's General Hosp	Gen	NPAsn	180	22	610	123	4 082
St Joseph's Hospital	Gen	Church	128	12	327	80	2 466
St Margaret Memorial Hospital	Gen	Church	129	21	328	66	2 581
South Side Hospital	Gen	NPAsn	207	18	406	161	5 450
Tuberculosis League Hosp	TB	NPAsn	100			137	276
U S Marine Hospital	Gen	USPHS	70			73	983
Western Pennsylvania Hospital	Gen	NPAsn	600	61	1 170	400	11 841
Pittston 18 746—Luzerne							
Pittston Hospital	Gen	NPAsn	100	17	320	68	3 480
Pottstown 19 430—Montgomery							
Homeopathic Hospital	Gen	NPAsn	50	10	116	22	883
Pottstown Hospital	Gen	NPAsn	64	11	299	43	1 380
Pottsville 24 300—Schuylkill							
Lemos B Warne Hospital	Gen	Indiv	78	12	No data supplied		
A C Milliken Hospital	Gen	NPAsn	46	10	169	32	1 203
Pottsville Hospital	Gen	NPAsn	138	12	393	120	3 399
Punxsutawney 9 266—Jefferson							
Adrian Hospital	Gen	NPAsn	73	11	203	63	2 196
Quakertown 4 000—Bucks							
Quakertown Hospital	Gen	NPAsn	44	12	109	20	740
Ransom 100—Lackawanna							
Ransom Home and Mental Hospital	Ment	County	366			366	60
Reading 111 171—Berks							
Berks County Tuberculosis Sanatorium	TB	County	134			134	124
Homeopathic Medical and Surgical Hospital	Gen	NPAsn	100	19	310	63	2 567
Reading Hospital	Gen	NPAsn	202	37	764	194	6 667
St Joseph's Hospital	Gen	Church	180	25	511	113	4 229
Renovo 3 940—Clinton							
Renovo Hospital	Gen	NPAsn	26	4	94	10	497
Retreat 9 000—Luzerne							
Retreat Mental Hospital	Ment	County	1 000			1 015	192
Ridgway 6 719—Elk							
Elk County General Hosp	Gen	NPAsn	62	9	165	36	1 321
Ridley Park 3 300—Delaware							
Taylor Hospital	Gen	NPAsn	64	15	203	40	1 619
Roaring Spring 2 704—Blair							
Nelson Hospital	Gen	NPAsn	52	12	119	25	877

PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Rochester 7 726—Beaver							
Rochester General Hospital	Gen	NPAsn	89	10	307	79	2 591
St Marys, 7 433—Elk							
Andrew Kaul Mem Hosp	Gen	Church	48	12	139	20	902
Sayre 7 002—Bradford							
Robert Packer Hospital	Gen	NPAsn	304	21	500	200	7 309
Schuylkill Haven 6 514—Schuylkill							
Schuylkill County Hospital for Mental Diseases	Ment	County	504			507	147
Scranton 143 433—Lackawanna							
Hahnemann Hospital	Gen	NPAsn	109	16	436	93	3 071
Lackawanna County Tuberculosis Hospital	TB	County	150			148	112
Mersey Hospital	Gen	Church	84	20	377	60	2 192
Moses Taylor Hospital	Gen	NPAsn	120			90	2 199
St Joseph's Children's and Maternity Hospital	MatCh	Church	185	24	26	90	160
St Mary's Mater Misericordiae Hospital	Gen	Church	71	12	225	47	1 376
Scranton Private Hospital	Gen	Corp	30	3	16	7	800
Scranton State Hospital	Gen	State	180	8	423	171	4 406
West Side Hospital	Gen	NPAsn	60	12	389	71	1 949
Sellersville 2 063—Bucks							
Grand View Hospital	Gen	NPAsn	65	8	181	30	949
Sewickley 5 599—Allegheny							
Valley Hospital	Gen	NPAsn	113	27	466	88	2 261
Shamokin 20 274—Northumberland							
Shamokin State Hospital	Gen	State	82	10	243	63	2 486
Sharon 25 908—Mercer							
Christian H Buhl Hosp	Gen	NPAsn	103	17	447	82	2 907
Shenandoah 21 782—Schuylkill							
Locust Mountain State Hospital	Gen	State	73	12	295	73	2 806
Somerset 4 305—Somerset							
Somerset Community Hosp	Gen	NPAsn	30	6	81	29	1 124
South Mountain 200—Franklin							
Pennsylvania State Hospital Tuberculosis Sanatorium	TB	State	1 028			971	1 192
Spangler 2 761—Cambria							
Miners Hospital of North Cambria	Gen	NPAsn	86	10	135	54	1 565
State—Cambria							
Pennsylvania State Tuberculosis Sanatorium No 2	TB	State	840			770	764
Sunbury 15 626—Northumberland							
Mary M Packer Hospital	Gen	NPAsn	61	9	163	49	1 543
Susquehanna 3 203—Susquehanna							
Simon H Barnes Memorial Hospital	Gen	NPAsn	15	5	36	9	226
Tarentum 9 551—Allegheny							
Allegheny Valley Hospital	Gen	NPAsn	88	10	299	79	2 392
Taylor 10 428—Lackawanna							
Taylor Hospital	Gen	NPAsn	41	7	No data supplied		
Titusville 8 000—Crawford							
Titusville Hospital	Gen	NPAsn	44	6	189	26	943
Torrance 500—Westmoreland							
Torrance State Hospital	Ment	State	1 604			1 606	299
Rated capacity 1 217							
Uniontown 19 044—Fayette							
Uniontown Hospital	Gen	NPAsn	200	25	420	200	5 260
Warren 14 863—Warren							
Warren General Hospital	Gen	NPAsn	80	14	397	60	2 316
Warren State Hospital	Ment	State	2 171			2 180	392
Rated capacity 1 673							
Washington 24 545—Washington							
Hillview Farms Sanitarium	Gen	Indiv	50	1		20	2 7
Washington Hospital	Gen	NPAsn	138	28	371	94	3 496
Waymart 902—Wayne							
Farview State Hospital	Ment	State	846			308	87
Rated capacity 708							
Waynesboro 10 167—Franklin							
Waynesboro Hospital	Gen	NPAsn	36	10	221	30	955
Waynesburg 4 015—Greene							
Greene County Memorial Hospital	Gen	NPAsn	34	6	No data supplied		
Wernersville 1 090—Berks							
Wernersville State Hospital	Ment	State	1 400			1 449	274
Rated capacity 1 466							
West Chester 12 320—Chester							
Chester County Hospital	Gen	NPAsn	137	22	389	90	3 171
Homeopathic Hospital of Chester County	Gen	NPAsn	63	10	179	35	1 231
White Haven 1 537—Luzerne							
White Haven Sanatorium	TB	NPAsn	200			221	321
Wilkes Barre 86 626—Luzerne							
Mersey Hospital	Gen	Church	190	20	300	125	4 008
Wilkes Barre General Hospital	Gen	NPAsn	364	41	769	200	8 603
Wyoming Valley Homeopathic Hospital	Gen	NPAsn	76	29	318	52	1 900
Wilkesburg 29 039—Allegheny							
Columbia Hospital	Gen	Church	137	26	575	109	4 101
Williamsport 40 729—Lycoming							
Rothfuss Clinic and Hosp	Gen	Indiv	30	6	27	7	249
Williamsport Hospital	Gen	NPAsn	231	44	625	131	4 900
Windber 9 200—Somerset							
Windber Hospital	Gen	NPAsn	107	10	269	80	3 157
Woodville 4 000—Allegheny							
Allegheny County Home and Hospital for the Insane	Ment	County	369	3	12	3 490	1 530
York 55 204—York							
West Side Sanitarium	Gen	NPAsn	70	10	41	21	742
York Hospital	Gen	NPAsn	164	20	727	103	4 009

Key to symbols and abbreviations is on page 986



## PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Bellefonte 4804—Centre Western State Penitentiary Hospital	Inst	State	24			10	430
Bellevue 10232—Allegheny Salvation Army Woman's Home and Hospital	Mat	Church	10	13	57	4	81
Broomall 1260—Delaware Convalescent Hospital	Conv	Frat	30			21	340
Bryn Mawr 3036—Montgomery Bryn Mawr College Infirmary	Inst	NP Assn	16			3	240
Cambridge Springs 1663—Crawford San Rosario Sanitarium	Conv	Church	30			6	104
Chester 59164—Delaware Mercy Hospital	Gen	Indiv	30	8	61	12	74
Darby 9839—Delaware St Francis Country House for Convalescents and St Francis Hall for Incurables	Conv Inc	Church	38	4		41	411
Ebensburg 3063—Cambria Cambria County Hospital	Inst	County	117	2		84	173
Elwyn 200—Delaware Elwyn Training School	MeDe	NP Assn	1040			905	78
Embserville 300—Chester Chester County Hospital for Insane	Vent	County	320			323	68
Erle 11067—Erie Lakeview Hospital	Iso	City	80				270
Gibsonia 2.0—Allegheny St Barnabas Free Home	Inc	Church	100			97	34
Harmarville 786—Allegheny Harmarville Convalescent Home	Conv	NP Assn	40	30		40	326
Huntingdon 7538—Huntingdon Pennsylvania Industrial School	Inst	State	30			9	222
Johstown 66993—Cambria Municipal Hospital	Iso	City	60			5	83
Lancaster 39949—Lancaster Lancaster County Home and Hospital for Insane	Vent	County	468			440	318
Lansdowne 9542—Delaware Sanatorium School	Orth	Indiv	30				16
Laurelton 327—Union Laurelton State Village	MeDe	State	650			694	23
Laurelton State Village			Rated capacity	606			
Merger 2125—Mercer Mercer County Home and Hospital	Vent	County	340			337	117
Middletown 6083—Dauphin Odd Fellows Home	Inst	Frat	30			30	60
Mont Clare 600—Montgomery River Crest Preventorium	TB	NP Assn	100		No data supplied		
Morganza 1500—Washington Pennsylvania Training School	Inst	State	20			10	512
Muncy 2413—Lycoming Muncy Valley Hospital	Gen	NP Assn	20	6	23	11	210
New Wilmington 997—Lawrence Overlook Sanitarium	Conv	Part	30			24	231
North East 3610—Erie St Barnabas House by the Lake	Inc	Church	30			30	19
Oakbourne (West Chester P O) 10—Chester James C Smith Memorial Home	Conv	Church	2		No data supplied		
Pennsylvania Epileptic Hospital and Colony Farm	Epil	NP Assn	118			118	18
Olyphant 10743—Lackawanna Blakely Home	Vent	County	107			140	27
Pennhurst (Spring City P O) 172—Chester Pennhurst State School	MeDe	State	172			1705	38
Pennhurst State School			Rated capacity	1746			
Philadelphia 190061—Philadelphia Babies Hospital	Chil	NP Assn	10			12	316
Belmont Hospital Salvation Army Home and Hospital	Mat	Church	10	10	121	5	171
Eastern State Penitentiary Hospital	Inst	State	80			54	1,998
Florence Crittenton Home	Mat	NP Assn	10	15	36	15	40
Home of the Merciful Saviour for Crippled Children	Orth	NP Assn	62			62	6
Homewood School	Inst	NP Assn	120	8	18	146	57
Kenwood Sanitarium	Conv	Corp	32			26	123
Logan Private Nursing Home	Conv	Indiv	15		No data supplied		
Philadelphia County Prison Hospital (Holmesburg)	Inst	CyCo	70			25	771
Philadelphia County Prison Hospital (Reed St Prison)	Inst	County	38			14	641
Philadelphia Home for Incurables	Inc	NP Assn	207			207	34
Pine Hall Convalescent Home	Conv	Indiv	30			16	30
Sharon Hall	Conv	Corp	30				
Widener Memorial Industrial Training School for Crippled Children	Orth	NP Assn	100			70	5
Pittsburgh 669517—Allegheny Fairview Sanatorium	Ment	Corp	10			8	7
Industrial Home for Crippled Children	Orth	NP Assn	50			70	110
Tewish Home for the Aged	Inst	NP Assn	30			5	34
Western Penitentiary Hospital	Inst	State	30			20	350

## PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Polk 3337—Venango Polk State School	MeDe	State	2,883			906	7
Pottstown 19450—Montgomery Hill School Infirmary	Inst	NP Assn	30				700
Retreat 2000—Luzerne Retreat Home and Hospital for Chronic Diseases	Inst	County	700			460	140
Rochester 7726—Beaver Passavant Memorial Homes for the Care of Epileptics	Epil	Church	173			118	3
Seranton 143433—Lackawanna Municipal Hospital for Contagious Diseases	Iso	City	40				11
Selingsgrove 2797—Snyder Selingsgrove State Colony for Epileptics	Epil	State	360			40	60
Selingsgrove State Colony for Epileptics			Rated capacity	442			
Somerset 4395—Somerset Somerset County Home and Hospital	Ment	County	340			480	40
State College 4400—Centre Pennsylvania State College Health Service Hospital	Inst	State	30			7	34
Towanda 4104—Bradford Mills Private Hospital	Gen	Indiv	19	8	117	5	27
Troy 1190—Bradford Martha Lloyd School	MeDe	NP Assn	90			70	9
Wellsboro 3643—Tioga Wellsboro Hospital	Gen	Indiv	9	2	22	3	10
Wilkes Barre 86626—Luzerne Contagious Diseases Hospital	Iso	City	12			3	67
Williamstown 2938—Dauphin Williams Valley Hospital	Gen	Indiv	24	2		1	28
Willow Grove 3000—Montgomery Willow Crest for Convalescents	Conv	NP Assn	70			10	103
Summary for Pennsylvania			Number	Beds	Average Census	Admissions	
Hospitals and sanatoriums			293	73 446	61 23	69,830	
Related institutions			61	11 97		13,800	
Totals			354	85 433	72 306	711 111	
Refused registration			24	349			

## RHODE ISLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Central Falls, 2088—Providence Notre Dame Hospital	Gen	NP Assn	60	11	83	94	97
East Greenwich 3666—Kent Crawford Allen Memorial Hospital	Unit of Rhode Island Hospital	Providence					
East Providence 2909—Providence Emma Pendleton Bradley Home	NervChil	NP Assn	30			40	83
Hillsgrove 1000—Kent St Joseph's Sanatorium	TB	Church	100				0
Howard 3000—Providence State Hospital for Mental Diseases	Ment	State	2 000			2 465	61
State Infirmary	Gen	State	1 006	64	49	1 600	60
Newport 27612—Newport Newport Hospital	Gen	NP Assn	1 14	30	40	162	941
Station Hospital	Gen	Army	44			176	11
U S Naval Hospital	Gen	Navy	182			2	100
Pawtucket 77149—Providence Memorial Hospital	Gen	NP Assn	166	30	613	130	193
Providence 202951—Providence Butler Hospital	N&M	NP Assn	174			11	170
Charles V Chapin Hosp	TB Iso	City	260			216	200
Homeopathic Hospital	Gen	NP Assn	166	34	634	130	400
Jane Brown Memorial Hosp	Unit of Rhode Island Hospital						
Miriam Hospital	Gen	NP Assn	63	14	273	4	140
Providence Lying In Hosp	Mat	NP Assn	105	150	2 625	169	70
Rhode Island Hospital	Gen	NP Assn	300			423	1000
St Joseph's Hospital	Gen	Church	207	43	706	203	461
Wakefield 4000—Washington South County Hospital	Gen	NP Assn	30	10	133	20	80
Wallum Lake 100—Providence State Sanatorium	TB	State	490			11	7
Westerly 10997—Washington Westerly Hospital	Gen	NP Assn	61	12	107	20	22
Woonsocket 49776—Providence Woonsocket Hospital	Gen	NP Assn	149	27	512	81	200
Related Institutions							
Bristol 11933—Bristol Rhode Island Soldiers' Home	Inst	State	82			8	0
Howard 2200—Providence Rhode Island State Prison	Inst	State	24			21	0
Howe 1700—Kent Lake Isle Home and Mary Murray Preventorium	Conv	NP Assn	30	25		11	11

## RHODE ISLAND—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
La Fayette 600—Washington Exeter School	McDe	State	600			616	142
		Rated capacity	500				
Providence 222 581—Providence	Conv	Indiv	20			15	33
Heath Sanatorium	Conv	Indiv	14			10	24
Heath Sanatorium Annex							
St Elizabeth Home for Incurables	Inc	Church	40			44	9
Summary for Rhode Island	Number	Beds	Average Census	Admissions			
Hospitals and sanatoriums	20	6,657	5,776	42,916			
Related institutions	7	745	826	834			
Totals	27	7,402	6,612	43,750			
Refused registration	1	60					

## SOUTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Abbeville 4 414—Abbeville	Gen	NP Assn	22	2	32	9	300
Abbeville County Memorial Hospital							
Aiken 6 033—Aiken	Gen	County	60	12	74	63	1 800
Aiken County Hospital							
Anderson 14 383—Anderson	Gen	NP Assn	74	10	2,2	63	2 770
Anderson County Hospital							
Bennettsville, 3 667—Marlboro	Gen	NP Assn	32	8	98	22	980
Marlboro County General Hospital							
Camden 5 183—Kershaw	Gen	Corp	50	6	123	20	1 020
Camden Hospital							
Charleston 6 26—Charleston	Gen	NP Assn	50	10	1,7	31	1 404
Baker Memorial Sanatorium	Gen	NP Assn	200	30	662	260	7 644
Roper Hospital							
St Francis Xavier Infr	Gen	Church	50	13	148	32	800
U S Naval Hospital	Gen	Navy	57	2	6	20	420
Chester 5 028—Chester	Gen	NP Assn	58	6	49	18	1 062
Pryor Hospital							
Clinton 5 643—Laurens	Gen	Part	20	0	22	7	301
Dr Hays Hospital							
Columbia 51 081—Richland	Gen	County	205	30	502	213	7 131
Columbia Hospital							
Good Samaritan Hospital (col)	Gen	NP Assn	60	6	89	40	1 022
South Carolina Baptist Hospital	Gen	Church	103	6	126	83	2 700
South Carolina State Hospital	Men	State	4 096			3 906	1 478
		Rated capacity	3 702				
Veterans Admin Facility	Gen	Vet	618			2,3	2 10
Waverly Fraternal Hospital (col)	Gen	Frat	68	4	48	20	608
Waverly Sanitarium	N CM	Corp	30			29	300
Conway 3 011—Horry	Gen	NP Assn	36	6	903	20	1 800
Conway Hospital							
Florence 14 774—Florence	Gen	County	41	3	12	24	491
Florence Darlington Tuber							
culosis Sanatorium	TB	County	64			29	64
McLeod Infirmary	Gen	NP Assn	160	10	187	170	4 704
Saunders Memorial Hosp	Gen	NP Assn	60	6	50	48	2 088
Gaffney 6 897—Cherokee	Gen	County	41	3	12	24	491
Cherokee County Hospital							
Greenville 29 154—Greenville	TB	County	82			70	184
Greenville County Sanat							
Greenville General Hosp	Gen	City	182	18	362	129	4 893
Dr Jervey's Private Hosp	FAT	Indiv	10			322	
St Francis Hospital	Gen	Church	90	20	387	88	3 600
Shriners Hospital for Crip	Orth	Frat	60			60	306
pled Children							
Working Benevolent Hospi	Gen	Frat	22	1	22	13	224
tal (col)							
Greenwood 11 000—Greenwood	Gen	CyCo	20	4	10	12	303
Brewer Hospital (col)	Gen	NP Assn	70	6	102	30	1 400
Greenwood Hospital							
Hartsville 0 067—Darlington	Gen	Indiv	50	3	123	12	600
Dyerly Hospital	Gen	Indiv	10	4		Estab	1937
Powe Hospital							
Kingstree 2 392—Williamsburg	Gen	Indiv	20	6	34	18	920
Kelley Sanatorium							
Lancaster 3 045—Lancaster	Gen	Indiv	30	4	32	20	4,2
Lancaster Hospital							
Laurens 5 443—Laurens	Gen	County	29	4	42	9	548
Laurens County Hospital							
Moncks Corner 623—Berkeley	G&TB	NP Assn	52	6	34	29	571
Berkeley County Hospital							
Moultrieville 0—Charleston	Gen	Army	90	3	18	60	1 449
Station Hospital							
Mullins 3 108—Marion	Gen	NP Assn	60	8	81	26	1 029
Mullins Hospital							
Navy Yard 1 02—Charleston	TB	County	60			60	97
Pinchaven Sanatorium							
Newberry 7 008—Newberry	Gen	NP Assn	20	5	48	11	570
Newberry County Hospital							
Orangeburg 8 70—Orangeburg	Gen	NP Assn	110	12	58	41	1 000
Tri County Hospital							

## SOUTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Parris Island 200—Beaufort	Gen	Navy	100	4	22	46	547
U S Naval Hospital							
Ridgewood (Columbia P O ) 600—Richland	TB	NP Assn	70			45	64
Ridgewood Tuberculosis Camp							
Rock Hill 11 322—York	Gen	Church	60	8	No data supplied		
St Philips Mercy Hospital							
Six Mile 150—Pickens	Gen	Indiv	32	3	20	20	574
Dr Peek's Hospital							
Spartanburg 28 723—Spartanburg	Gen	NP Assn	50	6	64	33	1 628
Mary Black Memorial Hos	Gen	County	304	16	305	197	5 207
pital							
Spartanburg General Hosp	Gen	County	304	16	305	197	5 207
State Park —Richland	Unit of	South Carolina Sanatorium	206			220	309
Palmetto Sanatorium (col)	TB	State	206				
South Carolina Sanatorium							
Sumter, 11 780—Sumter	Gen	NP Assn	88	12	141	66	1 941
Tuomey Hospital							
Walterboro 2,592—Colleton	Gen	Indiv	30	4	02	20	1 198
Charles Es Dorn Hospital							
Related Institutions							
Charleston 62 260—Charleston	Inst	City	24			5	241
Charleston Orphan House							
Clinton 0 643—Laurens	Inst	Church	40			10	624
Lesh Infirmary of Thorn	Inst	Church	40			10	624
well Orphanage	McDe	State	710			710	265
State Training School		Rated capacity	600				
Greenville 29 154—Greenville	Inst	NP Assn	42			2	130
Webb Memorial Infirmary							
Ridgeland 715—Jasper	Gen	Indiv	17	3	26	8	431
Evelyn Ritter Hospital							
Summerville 2 579—Dorchester	Gen	NP Assn	12	2	10	7	102
Arthur B Lee Hospital	Gen	NP Assn	10	0	No data supplied		
(col)							
Summerville Infirmary							
Sumter 11 700—Sumter	TB	Cy Co	20			22	00
Camp Alice Sumter County							
Tuberculosis Sanitarium							
Union 7 419—Union	Gen	County	20	3	31	12	474
Wallace Thomson Hospital							
Summary for South Carolina	Number	Beds	Average Census	Admissions			
Hospitals and sanatoriums	50	8 002	6,831	76 789			
Related institution	9	846	783	2 628			
Totals	59	9 848	7 614	79 417			
Refused registration	3	62					

## SOUTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aberdeen 16 460—Brown	Gen	Church	60	6	74	11	4 7
Aberdeen Good Samaritan	Gen	Church	114	20	301	70	2 602
Hospital							
St Luke's Hospital							
Belle Fourche 2 032—Butte	Gen	NP Assn	20	9	00	7	314
John Burns Memorial Hosp							
Bowdle 773—Edmunds	Gen	NP Assn	11	2	47	3	200
Community Hospital							
Brookings 4 370—Brookings	Gen	City	3	12	116	10	867
Brookings Municipal Hosp							
Burke 591—Gregory	Gen	NP Assn	12	5	01	7	202
Burke Hospital							
Cheyenne Agency 121—Dewey	Gen	IA	34	6			
Cheyenne River Indian Hosp							
Deadwood 2 009—Lawrence	Gen	Church	38	10	163	32	1 002
St Joseph's Hospital							
Dell Rapids 1 607—Minnehaha	Gen	Corp	30	6	26	9	230
Dell Rapids Hospital							
Edgemont 1 103—Fall River	Gen	Indiv	10	2	20	3	720
Edgemont Hospital							
Eureka 1 308—McPherson	Gen	NP Assn	20	4	01	11	417
Eureka Community Hosp							
Faulkton 739—Faulk	Gen	County	17	3			
Faulk County Hospital							
Flandreau 1 934—Moody	Gen	City	18	5		Estab	1907
Flandreau Municipal Hosp							
Ft Meade 800—Meade	Gen	Army	100	2	11	71	1 061
Station Hospital							
Ft Thompson 180—Buffalo	Gen	IA	24	7	37	17	464
Crow Creek Hospital							
Hot Springs 2 908—Fall River	Gen	Church	50	0	60	30	062
Lutheran Sanatorium and							
Hospital							
Our Lady of Lourdes Hos	Gen	Church	02	6	64	30	1 104
pital and Sanitarium							
Veterans Admin Facility	Gen	Vet	100			122	002
Huron 10 946—Beadle	Gen	NP Assn	04	8	126	20	1 001
Sprague Hospital							
Lead 0 703—Lawrence	Gen	NP Assn	20	5	1	13	067
Homestead Hospital							
Lemmon 1 008—Perkins	Gen	Indiv	12	5	10	4	180
Lemmon Hospital							
Madison 4 289—Lake	Gen	NP Assn	00	10	No data supplied		
Madison Community Ho p							

Key to symbols and abbreviations is on page 986

## SOUTH DAKOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Milbank 2389—Grant St Bernard Providence Hos pital	Gen	Church	23	8	76	7	386
Miller 2389—Hand Miller Hospital and Clinic	Gen	Part	18	5	60	9	32
Mitchell 10942—Davison Methodist State Hospital	Gen	Church	100	15	169	56	2 000
St Joseph Hospital	Gen	Church	100	13	176	58	2 397
Mobridge 3464—Walworth Lowe Hospital	Gen	Indiv	20	6	74	7	293
Mobridge Hospital	Gen	NPA'ssn	20	11	32	11	763
New Underwood 311—Pennington New Underwood Community Hospital	Gen	NPA'ssn	13	6	53	4	270
Pierre, 3639—Hughes St Mary's Hospital	Gen	Church	102	18	181	52	1 912
Pine Ridge 618—Shannon Pine Ridge Hospital	Gen	IA	49	11	136	42	1 252
Rapid City 10404—Pennington Black Hills Methodist Hos pital	Gen	Church	60	6	143	45	1,174
St John's McNamara Hos pital	Gen	Church	60	13	200	42	1 527
Redfield 2664—Splink Baldwin Community Hosp	Gen	City	12	3	30	8	284
Rosebud 120—Todd Rosebud Agency Indian Hospital	Gen	IA	58	8	120	40	1 006
Sanator 10—Custer South Dakota State Sana torium for Tuberculosis	TB	State	192			103	100
Sioux Falls 33362—Minnehaha McKenna Hospital	Gen	Church	100	20	264	74	2 567
Moe Hospital and Clinic	Gen	Indiv	50	8	99	20	712
Sioux Valley Hospital	Gen	NPA'ssn	116	20	271	61	2 330
Volga 604—Brookings Volga Hospital	Gen	Corp	16	4	32	10	300
Watertown 10214—Codington Bartron Hospital	Gen	Corp	60	8	107	57	1 688
Luther Hospital	Gen	Church	60	10	No data supplied		
Webster 1800—Dry Peabody Hospital	Gen	Indiv	50	7	No data supplied		
Winner 2290—Tripp Wilson Hospital	Gen	Indiv	10	2	20	3	182
Winner General Hospital	Gen	Part	14	6	64	4	340
Yankton 6072—Yankton Sacred Heart Hospital	Gen	Church	130	20	201	77	1 962
Yankton State Hospital	Gen	Ment State	170			1,604	379
Rated capacity 1,255							

## Related Institutions

Flandreau 1934—Moody Flandreau Indian School Hospital	Gen	IA	35	1	5	14	482
Garretson 605—Minnehaha De Vall Hospital	Gen	Indiv	10	2	13	2	63
Hot Springs 2908—Fall River State Soldiers Home Hosp	Inst	State	30			20	296
Pierre 3639—Hughes Pierre Indian School Hosp	Gen	IA	8			6	138
Platte 1207—Charles Mix Platte Hospital	Gen	Indiv	6	4	18	4	104
Redfield 2664—Splink State School and Home for Feeble-minded	MeDe	State	687			652	96
Rated capacity			687				
Sisseton 1840—Roberts Sisseton Indian Hospital	Gen	IA	35				Estab 1007
Wagner 1420—Charles Mix Duggan Hospital	Gen	Indiv	12	3	41	7	291
Yankton Indian Hospital	Gen	IA	24	6			Estab 1937

Summary for South Dakota	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	47	4 680	3 067	41 669
Related institutions	9	915	726	1 732
Totals	56	4 995	3 791	43 401
Refused registration	4	124		

## TENNESSEE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Athens 5385—McMinn Epperson Clinic Hospital	Gen	Indiv	23	2	57	6	404
Force Hospital	Gen	Part	13	6	25	5	300
Brownsville 3204—Haywood Haywood County Memorial Hospital	Gen	NPA'ssn	30	4	50	17	654
Chattanooga 110768—Hamilton Baroness Erlanger Hospi tal	Gen	CyCo	22	26	262	190	7 141
Children's Hospital	Gen	MatCh CyCo	7	11	240	32	1 340
Newell and Newell Sanit o	Gen	Part	60	3	20	31	1,003
Pine Breeze Sanatorium	TB	NPA'ssn	230			220	478
Clarksville 9242—Montgomery Clarksville Home Infirmary (col)	Gen	Indiv	20			5	305
Clarksville Hospital	Gen	NPA'ssn	40	6	60	13	718

## TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Cleveland 9136—Bradley Speck Hospital	Gen	NPA'ssn	32	3	5	5	160
Columbia 7882—Maury Kings Daughters Hospital	Gen	NPA'ssn	50	5	38	14	77
Dayton 2,006—Rhea Broyles Private Hospital	Gen	Indiv	12	2	14	6	201
Dyersburg 8733—Dyer Baird Brewer Gen Hosp	Gen	Corp	50	6	53	13	801
Elizabethton 8093—Carter St Elizabeth General Hosp	Gen	Corp	20	5	70	8	499
Erwin 3623—Unicoi Legion Memorial Hospital	Gen	Corp	14	3	40	3	006
Greeneville 5544—Greene Greeneville Sanatorium and Hospital	Gen	Corp	60	3	26	24	008
Takoma Hospital and San itarium	Gen	NPA'ssn	52	6	40	30	1 948
Humboldt, 4613—Gibson Oursler Clinic	Gen	Indiv	10	3	40	4	310
Jackson 22172—Madison Fitts White Clinic	Gen	Part	40	6	No data supplied		
Memorial Hospital	Gen	NPA'ssn	30	6	76	10	701
Webb Williamson Hospi tal	Gen	Corp	24	6	47	13	609
Jefferson City 1898—Jefferson Jefferson Hospital	Gen	Indiv	20	2	No data supplied		
Johnson City 20680—Washington Appalachian Hospital	Gen	Corp	50	10	180	33	1 007
Campbell's Eye Ear Nose and Throat Hospital	ENT	Indiv	10				660
Jones Eye Ear Nose and Throat Hospital	ENT	Indiv	17				
Parker Budd Clinic and Hospital	Gen	Part	20	2	11	6	371
Kingsport 11914—Sullivan Holston Valley Community Hospital	Gen	NPA'ssn	53	8	109	37	1 401
Knoxville 105802—Knox Beverly Hills Sanatorium	TB	CyCo	160			127	120
Dr H E Christenberry Eye Ear Nose and Throat Infirmary	FNT	Indiv	12			2	59
Eastern State Hospital	Ment State	152				1 445	414
Rated capacity 1 160							
Ft Sanders Hospital	Gen	NPA'ssn	100	16	146	103	4 160
Knoxville General Hosp	Gen	City	200	37	660	154	7 166
St Mary's Memorial Hosp	Gen	Church	60	12	184	43	1 806
Lawrenceburg 3102—Lawrence Lawrenceburg Sanitarium and Hospital	Gen	Corp	20	2	27	5	471
Lebanon 4606—Wilson Martha Gaston Hospital	Gen	Indiv	27	2	15	9	481
McFarland Hospital	Gen	Indiv	20	3	26	10	561
London 2578—London Harrison Memorial Hospital	Gen	Corp	10	1	3	3	193
Madison College—Davidson Madison Rural Sanitarium and Hospital	Gen	NPA'ssn	100	6	70	68	1 415
Maryville 4908—Blount Carson's Hospital	Gen	Indiv	20		10	11	209
Memphis 203143—Shelby Baptist Memorial Hosp	Gen	Church	350	20	689	313	14 711
Collins Chapel Connectional Hospital (col)	Gen	NPA'ssn	50	10	No data supplied		
Crippled Children's Hospital School	Orth	NPA'ssn	77				10
Garly Ramsay Hospital	Gen	Corp	42	8	61	27	1 400
Hospital for Crippled Adults	Orth	NPA'ssn	60			40	198
John Gaston Hospital	Gen	City	489	61	1,963	407	14 507
Lynchburg Sanitarium	N&M	Indiv	20			10	4
Memphis Eye Ear Nose and Throat Hospital	FNT	NPA'ssn	60			15	1 700
Methodist Hospital	Gen	Church	150	30	690	140	6 486
St Joseph's Hospital	Gen	Church	200	45	899	196	7 106
Turner Gotten Sanatorium	N&M	Part	22			100	1977
U S Marine Hospital	Gen	USPHS	100			10	1 709
Veterans Admin Facility	Gen	Vet	40			30	2,000
Wallace Sanitarium	N&M	Part	7			20	400
Willis C Campbell Clinic	Orth	Part	60			47	571
Morristown 7330—Hamblen Morristown General Hosp	Gen	NPA'ssn	20	3	23	10	067
Mountain Home—Washington Veterans Admin Facility	Gen	Vet	50			400	371
Murfreesboro 7097—Rutherford Rutherford Hospital	Gen	NPA'ssn	42	8	102	90	110
Nashville 103866—Davidson Central State Hospital	Ment State	17				1 706	671
Rated capacity 1 500							
City View Sanitarium	N&M	Indiv	60			1	416
Davidson County Tubercu losis Hospital	TB	County	390			20	320
Geo W Hubbard Hospital of McHerry Medical Col lege (col)	Gen	NPA'ssn	100	20	200	80	000
Hospital for the Criminal Insane	Unit of Central State Hospital						
Millie F Hale Hosp (col)	Gen	NPA'ssn	40	10	10	14	000
Nashville Gen Hosp	Gen	City	200	24	600	20	000
Protestant Hospital	Gen	NPA'ssn	100	18	423	70	000
St Thomas Hospital	Gen	Church	200	20	577	120	000
Vanderbilt University Hos pital	Gen	NPA'ssn	100	10	201	100	400
Newport 2989—Cooke Dr E F Northcutt Infr mary	Gen	Indiv	12	2	6	4	137

## TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Oakville 163—Shelby	TB	CyCo	300			297	42
Oakville Memorial Sanat							
Paris 8164—Henry	Gen	Indiv	24	4	21	9	436
McSwain Clinic	Gen	Part	23	2	28	6	449
Nobles Memorial Hospital							
Pleasant Hill 165—Cumberland	G&TB	NP Assn	20	4	No data supplied		
Uplands Cumberland Moun-							
tain Sanatorium							
Pressmen's Home 160—Hawkins							
International Printing Press							
men and Assistants' Union							
Sanatorium	TB	NP Assn	40				
Pulaski 3367—Giles	Gen	Indiv	23	3	14	7	430
Pulaski Hospital							
Ridgetop 195—Robertson	TB	Corp	40			20	43
Watson Sanatorium							
Rockwood 3398—Ronne	Gen	NP Assn	40	7	33	16	703
Chamberlain Mem Hosp							
Rogersville 1390—Hawkins	Gen	Indiv	14	3	18	5	100
Lyons Hospital							
Sewanee 530—Franklin							
Emerald Hodgson Memorial							
Hospital	Gen	Church	25	10	37	9	494
Springfield 5577—Robertson	Gen	County	39	8	40	13	338
Robertson County Hospital							
Sweetwater 2271—Monroe	Gen	Part	28	4	14	11	403
Sweetwater Hospital							
Western State Hospital—Hardeman	Ment	State	1902			1805	396
Western State Hospital			Rated capacity 1900				
Woodbury 502—Cannon	Gen	Indiv	23	6	16	11	411
Good Samaritan Hospital							

## Related Institutions

Chattanooga 119798—Hamilton	Ment	County	202			181	142
William L. Bork Memorial							
Hospital							
Copperhill 1000—Polk	Gen	Corp	10		7	1	74
Tennessee Copper Company's							
Hospital							
Donelson 110—Davidson	MeDe	State	518			623	49
Tennessee Home and Train-			Rated capacity 500				
ing School for Feeble							
Minded Persons							
Etowah 4209—McMinn	Gen	Indiv	9	3	29	3	193
Etowah Hospital							
Fayetteville 3822—Lincoln	Gen	County	30	2	24	14	519
Lincoln County Hospital							
Knoxville 100502—Knox	Orth	NP Assn	30			Estab 1037	
Knox County Crippled Chil-							
dren's Hospital	Inst	State	20			4	302
Tennessee School for Deaf							
University of Tennessee Hos-	Inst	State	13			4	303
pital							
Memphis 23143—Shelby	Inst	County	803			670	340
Shelby County Hospital							
Nashville 103866—Davidson	MentIso	County	707	4	5	732	537
Davidson County Hosp							
Davidson County Isolation							
Hospital		Unit of Davidson County Hospital					
Junior League Home for	Orth	NP Assn	36			35	78
Crippled Children							
Tennessee State Penitentiary	Inst	State	82			15	040
Hospital							
Pickwick Dam—Hardin	Gen	Fed	22	2	33	5	722
Pickwick Dam Infirmary							
Raleigh 287—Shelby							
Cheerfield Farm Prevento-							
rium		Unit of Oakville Memorial Sanat					
Shelbyville 5010—Bedford	Gen	NP Assn	23	2	No data supplied		
Bedford County Hospital							

## Summary for Tennessee

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	81	12 985	10 114	130 092
Related Institutions	16	2 703	2 312	4 806
Totals	97	14 988	12 426	135 698
Refused registration	10	204		

## TEXAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Abilene 23175—Taylor	Epil	State	1200			1 110	221
Abilene State Hospital		Rated capacity 1100					
Allice 4239—Jim Wells	Gen	Church	88	12	302	56	4 471
Hendrick Memorial Hosp							
Allice Hospital	Gen	Corp	23	4	36	7	409
Amarillo 43102—Potter	Gen	County	73	10	216	59	2 040
Northwest Texas Hospital							
St Anthony's Hospital	Gen	Church	98	12	318	60	2 687
Atlanta 1683—Cass	Gen	Part	11	3	68	8	396
Ellington Memorial Hosp							
Austin 53190—Travis	Ment	State	2343			2 325	340
Austin State Hospital		Rated capacity 2390					

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Brackenridge Hospital	Gen	City	135	10	719	90	4 243
St David's Hospital	Gen	Church	44	8	129	30	1 995
Seton Infirmary	Gen	Church	98	14	344	73	3 280
Bastrop 1895—Bastrop							
F A Orgain Memorial Hosp	Gen	NP Assn	14	3	16	4	203
Bay City 4010—Matagorda							
Dr Loos Hospital	Gen	Indiv	16	3	41	4	247
Beaumont 57732—Jefferson							
Hotel Dieu Hospital	Gen	Church	161	12	302	80	2 993
Jefferson County Tubercu-							
losis Hospital	TB	County	83			84	126
Jefferson County Tubercu-							
losis Hospital (col)	TB	County	22			22	32
St Theresa Hospital	Gen	Church	73	10	306	43	1 944
Beeville 4806—Bee							
Beeville Hospital	Gen	Indiv	30	4	33	14	020
Thomas Memorial Hospital	Gen	Part	22	4	68	12	
Belton 370—Bell							
Belton General Hospital	Gen	Part	12	2	15	2	740
Big Spring 13733—Howard							
Big Spring Hospital	Gen	Corp	33	6	149	15	1 489
Bivings Hospital	Gen	Indiv	19	6	63	7	431
Bonham 5655—Fannin							
S B Allen Memorial Hosp	Gen	NP Assn	32	4	42	11	017
Borger 6532—Hutchinson							
North Plains Hospital	Gen	County	14	4	No data supplied		
Bowie 3131—Montague							
Bowie Clinic Hospital	Gen	Corp	15	3	17	7	386
Brackettville 1822—Kinney							
Station Hospital	Gen	Army	40	2	30	33	710
Brady 3983—McCulloch							
Brady Hospital	Gen	Part	43	5	143	23	1 093
Brenham 5974—Washington							
St Francis Hospital	Gen	Church	30	5	30	9	426
Sarah B Milroy Memorial							
Hospital	Gen	Corp	21	2	23	5	298
Brownsville 22021—Cameron							
Mercy Hospital	Gen	Church	00	8	97	17	772
Station Hospital	Gen	Army	60	1	20	16	535
Brownwood 12789—Brown							
Central Texas Hospital	Gen	Corp	32	2	13	12	037
Medical Arts Hospital	Gen	Corp	36	4	39	10	638
Stump Hospital	Gen	Indiv	12	4	68	2	1877
Bryan 7814—Brazos							
St Joseph Hospital	Gen	Church	30	3	60	7	402
Wilkinson Memorial Clinic	Gen	Indiv	19	2	98	7	030
Cameron 4565—Milan							
Cameron Hospital	Gen	Part	00	4	103	20	708
Canadian 2068—Hemphill							
Canadian Hospital	Gen	Indiv	10	2	29	3	107
Canyon 2821—Randall							
Nebbett Hospital	Gen	Indiv	7	3	12	4	104
Center 2510—Shelby							
Center Sanitarium	Gen	Indiv	13	1			
Warren Hospital	Gen	Part	12	1	8	4	126
Childress 7163—Childress							
Jeter Townsend Hospital	Gen	Part	30	2	08	3	234
Clisco 6027—Eastland							
Craham Sanitarium	Gen	Indiv	22	2	48	7	2 778
Cleburne 11539—Johnson							
Cleburne Sanitarium	Gen	Indiv	12	4	30	3	215
Coleman 0078—Coleman							
Overall Memorial Hospital	Gen	CyCo	40	2	77	7	367
Colorado 4671—Mitchell							
C L Root Hospital	Gen	Indiv	10	2	31	6	401
Conroe 2407—Montgomery							
Mary Swain Sanitarium	Gen	Indiv	18	4	23	3	300
Corpus Christi 27741—Nueces							
Fred Roberts Memorial							
Hospital	Gen	NP Assn	05	10	99	27	1 877
Medical Professional Hosp	Gen	Corp	30	4	29	18	1 469
Spohn Hospital	Gen	Church	00	12	203	38	2 762
Corsicana 15002—Navarro							
Corsicana Hospital and							
Clinic	Gen	Corp	20	2	21	5	187
Navarro Clinic Hospital	Gen	Part	24	4	70	7	606
Physicians and Surgeons							
Hospital	Gen	County	00	6	71	11	092
Crockett 4441—Houston							
Crockett Clinic and Jim							
Smith Memorial Hospital	Gen	Part	16	2	39	5	393
Crystal City 6609—Zavala							
Crystal Hospital	Gen	Corp	12	2	7	2	111
Cuero 4672—De Witt							
Burns Hospital	Gen	Church	3	3	23	10	400
Lutheran Hospital	Gen	Church	20	2	10	6	374
Dallas 26047—Dallas							
Baylor University Hosp	Gen	Church	375	08	1 014	284	13 787
Beverly Hills Sanitarium	N&M	Corp	30			26	217
Bradford Memorial Hospital							
for Babies	Chil	NP Assn	60	11		31	868
Carrell Driver Girard Clinic							
and Dallas Orthopedic Hos-							
pital	Orth	Part	23			8	200
Dallas Medical and Surgical							
Clinic Hospital	Gen	Part	27			17	1 112
Medical Arts Hospital	Gen	Indiv	86			60	3 819
Methodist Hospital	Gen	Church	100	23	619	63	3 764
Nightingale Lying In Hosp							
Parkland Hospital	Unit of Baylor University Hospital						
Pinkston Clinic (col)	Gen	CyCo	26	3	1 214	242	8 073
Rushing Clinic and Sanit	Gen	Indiv	15	2	15	6	262
	Gen	Indiv	23	3	14	17	624

Key to symbols and abbreviations is on page 986

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
St Pauls Hospital*	Gen	Church	270	30	971	205	8,947
Texas Scottish Rite Hospital for Crippled Children	Orth	Frat	60			53	847
Timberlawn Sanitarium	Ment	Corp	33			25	222
Woodlawn Hospital	TB	CyCo	118			105	225
Decatur 2037—Wise							
Rogers Hospital	Gen	Indiv	15	5	126	10	819
Denison 138.0—Grayson							
Denison City Hospital	Gen	NPAscn	25	3	80	12	481
M K T Railroad Employees Hospital	Indus	NPAscn	60			26	936
Denton 9587—Denton							
Denton Hospital and Clinic	Gen	Indiv	25	5	47	12	529
Edinburg 4821—Hidalgo							
City County Hospital	Gen	CyCo	65	11	30	18	655
Electra 6712—Wichita							
Electra Hospital	Gen	Indiv	24	4	36	4	210
El Paso 102421—El Paso							
El Paso City County Hosp*	Gen	CyCo	196	8	323	117	3,641
El Paso Masonic Hospital*	Orth	Frat	10	13	236	40	1,276
Hendricks Laws Sanatorium	TB	Part	70			27	67
Hotel Dieu Sisters Hosp*	Gen	Church	100	20	452	60	2,331
Long Sanatorium	TB	Indiv	50			16	47
Price Sanatorium	TB	Indiv	20			25	
Providence Hospital	Gen	Indiv	40	3		26	1,345
St Josephs Sanatorium	TB	Church	75		No data supplied		
Southern Baptist Sanat	TB	Church	80		No data supplied		
Southwestern General Hosp	Gen	Corp	150	12	94	61	1,170
William Beaumont General Hospital*	Gen	Army	602	7	54	358	4,010
Floresville 1581—Wilson							
Oxford Archer Hospital	Gen	Part	11	3	14	4	382
Ft Worth 16347—Tarrant							
All Saints Episcopal Hosp	Gen	Church	72	12	176	15	728
Baptist Hospital and Clinic	Gen	Church	20	5	40	15	826
City and County Hospital*	Gen	CyCo	96	15	702	90	3,540
W I Cook Memorial Hosp*	Gen	NPAscn	22	6	102	20	1,033
Ft Worth Childrens Hosp*	Child	NPAscn	35			25	310
Methodist Hospital*	Gen	Church	100	27	717	83	3,104
St Josephs Hospital*	Gen	Church	170	20	538	111	4,374
Freeport 3162—Brazoria							
Freeport Hospital	Gen	Indiv	16	6	94	6	1,420
Galveston 5295—Galveston							
Galveston State Psychopathic Hospital*	Ment	State	100			57	290
		Rated capacity	100				
Hospital for Crippled and Deformed Children	Orth	City	80			Estab 1977	
John Sealy Hospital**	Gen	City	422	24	508	306	5,827
St Marys Infirmary*	Gen	Church	205	20	408	125	3,992
Station Hospital	Gen	Army	25			17	806
U S Marine Hospital	Gen	USPHS	206			171	2,235
Georgetown 3583—Williamson							
Martin Hospital	Gen	Indiv	20	4	19	3	273
Climer 1963—Upshur							
Flmwood Sanitarium	Gen	Indiv	1	3			
Oak Lawn Sanitarium	Gen	Part	15	2	40	4	31
Ragland Clinic Hospital	Gen	Part	15	5	115	6	500
Cladewater 6000—Clegg							
Gladewater Hospital	Gen	Indiv	17	2	56	3	204
Conzaes 3850—Gonzales							
Holmes Hospital	Gen	Corp	20	1	15	6	150
Gorman 1154—Eastland							
Blackwell Sanitarium	Gen	Part	30	3			
Graham 4981—Young							
Graham Hospital	Gen	NPAscn	18	2	173	12	603
Greenville 12407—Hunt							
Dr E P Beeton Hospital	Surg	Indiv	16		3	9	397
Groesbeck 2059—Limestone							
Dr Coxs Hospital	Gen	Indiv	12	4	15	1	67
Hallettsville 1406—Lavaca							
Renger Hospital	Gen	Indiv	15	4	13	4	182
Hamilton 2084—Hamilton							
Hamilton Sanitarium	Gen	Corp	54	4	No data supplied		
Harrington 12124—Cameron							
Medical Arts Clinic	Gen	Indiv	8	3		Estab 1934	
Valley Baptist Hospital	Gen	Church	55	10			
Henderson 2492—Rock							
Henderson Hospital	Gen	NPAscn	43	9	91	18	852
Hereford 2458—Deaf Smith							
Deaf Smith County Hosp	Gen	County	25	6	64	4	250
Hillsboro 7523—Hill							
Boyd Sanitarium	Gen	Indiv	23	3	14	6	263
Houston 29232—Harris							
Autry Memorial Hospital							
School Childrens	Unlt	of Houston					
Dr Greenwood Sanitarium	Gen	Corp	40	8	271	16	1,223
Helights Clinic Hospital	Gen	Corp	40	8	271	16	1,223
Houston Eye Ear Nose and Throat Hospital	FNT	Corp	24			3	1,140
Hermann Hospital*	Gen	NPAscn	176	24	297	123	4,496
Houston Negro Hospital	Gen	NPAscn	50	4	72	23	717
Houston Tuberculosis Ho p	TB	CyCo	172			16	268
Jefferson Davis Ho pital*	Gen	CyCo	220	17	1,219	192	8,356
Memorial Hospital*	Gen	Church	150	20	140	172	12,773
Methodist Hospital*	Gen	Church	100	10	442	85	3,731
Park View Hospital	Gen	Corp	30	6	100	12	618
St Josephs Infirmary*	Gen	Church	255	25	1,411	194	7,822
Southern Pacific Ho pital	Indus	NPAscn	140			75	2,139
Turner Urological Institute	Urol	Part	16			10	263
Huntsville 5028—Walker							
Huntsville Memorial Hosp	Gen	NPAscn	25	3	55	4	466

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Jacksonville 6748—Cherokee							
Nan Travis Memorial Hosp	Gen	NPAscn	50	6	102	29	1,671
Jasper 3393—Jasper							
Hardy Hancock Hospital	Gen	Part	17	2			
Kelly Field—Bexar							
Station Hospital	Gen	Army	30			25	1,068
Kenedy 2610—Karnes							
Kenedy Clinic and Hospital	Gen	Corp	16	2	24	8	538
Kerrville 4546—Kerr							
Kerrville General Hospital	Gen	Indiv	20	3		7	301
Kerrville State Sanatorium	TB	State	101			Estab 1977	
Mountain View Sanatorium	TB	Indiv	30			4	
Sunny-side Sanatorium	TB	Indiv	20			18	50
Kingsville 6815—Kleberg							
Kleberg County Hospital	Gen	County	50	6	47	25	643
Knox City 906—Knox							
Knox County Hospital	Gen	County	25	4	80	10	441
La Grange 2354—Fayette							
La Grange Hospital	Gen	Corp	45	5	35	15	618
Lamesa 3128—Dawson							
Lamesa Sanitarium	Gen	Indiv	10	4	No data supplied		
J C Loveless Hospital	Gen	Indiv	17	4	149	6	528
Lampasas 2709—Lampasas							
Rollins Brook Hospital	Gen	Part	21	3	105	15	835
Laredo 82618—Webb							
Mercy Hospital	Gen	Church	75	6	108	30	1,117
Station Hospital	Gen	Army	35	2	3	12	554
Legion 100—Kerr							
Veterans Admin Facility	C&TB Vet		402			401	1,887
Liberty 2187—Liberty							
Mercy Hospital	Gen	Church	20	4	87	8	113
Livingston 1165—Polk							
Bergman Hospital	Gen	Indiv	14	2	No data supplied		
Livingston Hospital	Gen	Indiv	16	2	89	8	684
Longview 5036—Gregg							
Hurst Eye Ear Nose and Throat Hospital	ENT	Indiv	12			3	825
Markham McRee Memorial Ho pital	Gen	NPAscn	35	8	150	9	555
Lubbock 20520—Lubbock							
Lubbock Sanitarium	Gen	Corp	85	15	178	62	2,997
Palms Hospital and Clinic	Gen	Part	22	6		Estab 1912	
West Texas Hospital	Gen	Corp	50	10	14	50	6,093
Lufkin 7311—Angelina							
Angelina County Hospital	Gen	County	43	5	125	50	1,055
Madisonville 1294—Madison							
Heath Hospital and Clinic	Gen	Indiv	18	2	29	4	743
Maria 3505—Presidio							
Station Hospital	Gen	Army	50			10	417
Marlin 5338—Falls							
Buie Allen Hospital	Gen	Indiv	23	2	18	18	675
Torbett Sanatorium and Diagnostic Clinic	Gen	Indiv	50	4	51	50	1,718
Marshall 16703—Harris							
Kahn Memorial Hospital	Gen	Indiv	23	7	44	10	548
Texas and Pacific Railway Employees Hospital	Indus	NPAscn	105			60	650
McAllen 9074—Hidalgo							
McAllen Municipal Hosp*	Gen	City	57	8	100	21	849
McKinney 7507—Collin							
McKinney City Hospital*	Gen	City	46	4	41	20	111
Memphis 4257—Hall							
Memphis Hospital	Gen	Indiv	15	2	17	5	215
Mercedes 6608—Hidalgo							
Mercedes General Hospital	Gen	NPAscn	21	4	67	3	07
Midland 5454—Midland							
Midland Clinic Hospital	Gen	Indiv	14	1	22	5	256
Mineral Wells 5086—Palo Pinto							
Nazareth Hospital	Gen	Church	40	4	47	6	590
Nacogdoches 5657—Nacogdoches							
City Memorial Hospital	Gen	City	40	6	59	15	91
Nassau 5125—Crimess							
Brazos Valley Sanitarium	Gen	Corp	27	4	75	8	661
New Braunfels 6247—Comal							
Comal Sanitarium	Gen	Indiv	20	2	27	2	101
New Braunfel Hospital	Gen	Indiv	20	3	27	6	291
Newgulf—Wharton							
Texas Gulf Sulphur Company Hospital	Gen	NPAscn	23	2		6	254
Odeesa 2407—Fetor							
Hendles Hospital	Gen	Indiv	18	4	35	10	600
Orange 7512—Orange							
Frances Ann Luther Hosp	Gen	Indiv	40	10	57	17	478
Paducah 2582—Cottle							
W Q Richard Memorial Hospital	Gen	Indiv	20	12	No data supplied		
Palestine 11445—Anderson							
Missouri Pacific Lines Ho p	Indus	NPAscn	7			27	97
Palestine Sanitarium	Gen	Corp	22	2		5	231
Pampa 10450—Gray							
Worley Memorial Ho pital	Gen	Indiv	31	8	257	50	1,525
Paris 15642—Lamar							
Tamar County Hospital	Gen	County	5	7	77	21	87
St Joseph Infirmary	Gen	Church	60	6	71	12	618
Sanitarium of Paris*	Gen	Corp	62	7	71	55	1,877
Pecos 3504—Reeves							
Camp and Camp Hospital	Gen	Part	20	4	69	7	597
Phillips (Borger P O)—Hutchinson							
Pantex Hospital of the Phillips Petroleum Co	Gen	Corp	12	2	57	3	717
Plainview 5534—Hale							
Plainview Sanitarium and Clinic*	Gen	Indiv	50	6	97	23	1,111

Key to symbols and abbreviations is on page 986

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Pt Arthur 5002—Jefferson Memorial	Gen	Church	175	20	231	66	2 400
Prairie View Hospital (col)	Gen	State	50	2	6	25	774
Quannah 4464—Hardeman Memorial Hospital	Gen	County	40	6	72	14	965
Ranger 6798—Eastland City County Hospital	Gen	CyCo	30	3	No data supplied		
West Texas Clinic Hosp	Gen	Corp	18	2	22	8	202
Rio Grande City 2283—Starr Station Hospital	Gen	Army	30		18	9	284
Robstown 4183—Nueces Robstown Clinic Hospital	Gen	Corp	14	4	36	5	630
Roscoe 1200—Nolan Young Hospital	Gen	Indiv	23	7	38		515
Rusk 3800—Cherokee Rusk State Hospital	Ment	State	2 131			2 074	306
San Angelo 2308—Tom Green Clinic Hospital	Gen	Corp	45	10	132	18	1 192
St John's Hospital	Gen	Church	25	5	47	15	714
Shannon West Texas Memorial Hospital	Gen	NPA'sn	100	15	248	55	2 875
San Antonio 231542—Bexar Grace Lutheran Sanatorium	TB	Church	50			27	87
Dr Kenney's Sanatorium	Gen	Indiv	25	4	27	13	366
Medical and Surgical Memorial Hospital	Gen	NPA'sn	100	15	242	60	3 324
Dr Moody's Sanatorium	N&M	Corp	50			38	269
NK Hospital	Gen	Corp	145	24	559	133	4 471
Robert B Green Memorial Hospital	Gen	County	175	20	658	155	4 942
San Antonio State Hosp	Ment	State	2 644			2 632	630
Santa Rosa Hospital	Gen	Church	279	26	551	166	5 982
Station Hospital	Gen	Army	668	16	296	459	7 288
Woodmen of the World War Memorial Hospital	TB	Frat	160			115	192
Sanatorium 1040—Tom Green State Tuberculosis Sanat	TB	State	865			781	2 126
San Marcos 5134—Hays Soldiers and Sailors Memorial Hospital	Gen	CyCo	20	2	20	4	344
Santa Anna 1883—Coleman Sealy Hospital	Gen	Indiv	35	3	108	29	1 587
Sealy 1500—Austin Sealy Hospital	Gen	Indiv	8	2	21	4	301
Seguin 522—Guadalupe Seguin Hospital	Gen	Corp	22	3	43	5	327
Seymour 2066—Baylor Baylor County Hospital	Gen	County	18	3	94	7	442
Shamrock 3780—Wheeler Shamrock General Hospital	Gen	Indiv	25	5	47	9	402
Sherman 15713—Grayson St Vincent's Sanatorium	Gen	Church	50	6	86	32	1 113
Wilson N Jones Hospital	Gen	NPA'sn	66	6	103	35	1 713
Shiner 1312—Lavaca Dr Wagner's Hospital	Gen	Indiv	18	2	15	6	305
Stanton 3846—Lubbock Mercy Hospital	Gen	Church	40	6	12	5	300
Snyder 3008—Scurry Snyder General Hospital	Gen	Corp	25	4	48	7	512
Spur 1899—Dickens Nichols Sanatorium	Gen	Indiv	20	4	8	4	105
Stamford 4095—Jones Stamford Sanatorium	Gen	Corp	60	10	183	24	1 407
Stephenville 3944—Erath Stephenville Hospital	Gen	Corp	35	3	42	10	870
Sugar Land 2019—Ft Bend Laura Eldridge Hospital	Gen	NPA'sn	24	3	51	10	738
Sweetwater 10848—Nolan Sweetwater Hospital	Gen	City	40	6	85	16	1 147
Taylor 7463—Williamson Wedemeyer Hospital	Gen	Corp	20	5	41	14	5 110
Teague 3509—Freestone Davidson Sanatorium	Gen	Indiv	20	3	64	10	365
Temple 15345—Bell Gulf Colorado and Santa Fe Hospital	Indus	NPA'sn	150			40	1 269
Kings Daughters Clinic and Hospital	Gen	NPA'sn	110	8	73	63	2 811
Scott and White Hospital	Gen	Corp	169	6	91	117	3 595
Woodson Eye Ear Nose and Throat Hospital	ENT	Part	11			4	351
Terrell 8795—Kaufman Alexander Holton Hospital	Gen	Part	25	2	No data supplied		
Terrell State Hospital	Ment	State	2 600			2 504	508
Texarkana 16602—Bowie Texarkana Hospital	Gen	NPA'sn	40	6	75	23	1 022
Timpson 1545—Shelby Timpson Hosp and Clinic	Gen	Part	15	3		Estab	1937
Tyler 17113—Smith Bryant Clinic and Sanit	Gen	Part	16	3	37	14	721
Mother Frances Hospital	Gen	Church	64	18	118	20	798
Vernon 9157—Wilbarger Christ the King Hospital	Gen	Church	27	3	15		262
Moore Brothers Hospital	Gen	Part	16	3	25	7	410
Vernon Sanatorium	Gen	Indiv	25	6	94	7	464
Victoria 7421—Victoria Do Tar Memorial Hospital	Gen	Indiv	25	6	70	14	690
Victoria Hospital	Gen	Corp	22	7	59	9	450

TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Von Ormy 350—Bexar Von Ormy Cottage Sanat	TB	Corp	35			18	20
Waco 52848—McLennan Central Texas Baptist Sanit	Gen	Church	75	10	218	39	2 149
Colgin Hospital and Clinic	Gen	Corp	40	2	16	5	313
Men's Hospital Baylor Uni	Gen	Church	15			Estab	1957
Providence Hospital	Gen	Church	130	20	502	80	4 155
Veterans Admin Facility	Ment	Yct	947			617	907
Waxahachie 8042—Ellis Waxahachie Sanatorium	Gen	NPA'sn	30	5	50	14	629
Wentherford, 4912—Parker Medical and Surgical Clinic	Gen	Part	10	4	43	6	317
Wellington 3570—Collingsworth Collingsworth Hospital	Gen	Indiv	10	4	29	3	240
Wellington Hospital	Gen	Indiv	16	3	58	4	335
Wharton 2691—Wharton Caney Valley Hospital	Gen	Corp	20	4	66	7	478
Wheeler 931—Wheeler Wheeler Hospital	Gen	Part	12	3	77	5	367
Wichita Falls 43690—Wichita Bethania Hospital	Gen	Church	32	8	267	15	1 010
Wichita Falls Clinic Hosp	Gen	Part	75	6	117	45	2 514
Wichita Falls State Hosp	Ment	State	2 232			2 215	556
Wichita General Hospital	Gen	CyCo	140	8	275	55	2 434
Winkum 5656—Lavaca Huth Memorial Hospital	Gen	Church	25	10	54	10	350
Yorktown 1882—De Witt Allen Hospital	Gen	Indiv	12	3	9		852
Related Institutions							
Arlington 3661—Tarrant Knights Templar Hospital	Inst	Frat	25			17	140
Austin 53120—Travis Austin State School	MeDe	State	1 395			1 293	245
Oaks Sanatorium	N&M	Corp	25			14	60
Texas Confederate Home	Inst	State	100				
Texas Deaf Dumb and Blind Institute	Inst	State	30			4	242
Bellville 4806—Austin Bellville Hospital	Gen	Part	8	1	15	4	295
College Station 1500—Brazos Agricultural and Mechanical College Hospital	Inst	State	125			10	2 957
Dallas 260475—Dallas Virginia K Johnson Home and School	Mat	Church	15	12	12	1	12
Ennis 7069—Ellis Municipal Hospital	Gen	City	20	3	40	8	276
Forney 1216—Kaufman Forney Sanatorium	Gen	NPA'sn	25	7	4		17
Ft Worth 163477—Tarrant Elmwood Sanatorium	TB	CyCo	65			53	65
Howard Sanatorium	Conv	Part	14			10	74
Gatesville 2601—Coryell Milton Powell Memorial Hospital	Gen	Part	11	2	30	2	202
Greenville 12407—Hunt Dr Joe Beeton's Hospital	Surg	Indiv	17	2	9	4	183
Hallettsville 1406—Lavaca Dufner Hospital	Gen	Indiv	8	2	15	4	86
Houston 292352—Harris Keightley Private Sanat	N&M	Indiv	25			20	88
Huntsville 5028—Walker Texas State Prison Hosp	Inst	State	108				
Hutchins 400—Dallas City County Convalescent Hospital	Conv	CyCo	250			218	131
Luling 5970—Caldwell Luling Hospital	Gen	Part	15	4	No data supplied		
Marlin 5338—Falls Crippled Children Hospital	Orth	NPA'sn	36				303
Marshall 16203—Harrison Sheppard Sanatorium (col)	Gen	Indiv	33	3	No data supplied		
Midland 5484—Midland Mid West Hospital Clinic	Gen	Indiv	12	2	58	4	336
Mt Vernon 1222—Franklin Crutcher Hospital	Gen	NPA'sn	10	2	5	1	80
Nixon 1037—Gonzales Crest View Hospital	Gen	Indiv	8	2	14	3	116
Odesa 2407—Extor Wood Hospital	Gen	Indiv	10	2	50	5	367
Pearsall 2536—Frio J E Bealls Day Hospital	Gen	Indiv	10	4	15	3	137
Pecos 3304—Reeves Pecos Sanatorium	Gen	Indiv	9	3	37	3	209
Perryton 2524—Ochiltree Perryton Hospital	Gen	Indiv	8			31	4 212
Poteet 1231—Atascosa Shotts Memorial Hospital	Gen	Indiv	12	2	51	3	239
San Antonio 231542—Bexar Dr Farmer's Sanatorium	TB	Indiv	20				15
Medical Arts Hospital	Gen	Corp	33	5	125	23	1 867
Physicians and Surgeons Hospital	Gen	Corp	60	12	141	27	1 263
Salvation Army Women's Home	Mat	Church	39	15	48	5	54
Station Hospital	Gen	Army	16			5	690
Shamrock 3750—Wheeler Shamrock Clinic Hospital	Gen	Part	14	3		Estab	1937

## TEXAS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Southton 89—Bexar Bexar County Tuberculosis Colony	TB	County	70		No data supplied		
Tulia 2,202—Swisher Swisher County Hospital	Gen	County	10	4	No data supplied		
Wichita Falls 43 690—Wichita Dr. White's Sanitarium	N C M	Corp	18			10	115
<b>Summary for Texas</b>							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institution	262	29,995	23,199	375,232			
	38	2,614	1,859	14,255			
Totals	300	32,612	25,058	389,517			
Refused registration	26	663					

## UTAH

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Bingham Canyon 3 248—Salt Lake Bingham Canyon Hospital	Gen	Indiv	35	6	36	14	584
Brigham 5 093—Box Elder Cooley Memorial Hospital	Gen	Indiv	18	12	190	10	553
Cedar City, 3 615—Iron Iron County Hospital	Gen	County	50	14	205	19	897
Ft. Douglas 1 071—Salt Lake Station Hospital	Gen	Army	50			40	528
Ft. Duchesne 104—Utah Utah and Ouray Agency Indian Hospital	Gen	IA	20	2	51	17	293
Heber 2 447—Wasatch Heber Hospital	Gen	Indiv	12	6	32	4	148
Lehi 2 826—Utah Lehi Hospital	Gen	City	15	6	88	8	214
Logan 9 979—Cache Cache Valley General Hosp	Gen	NP Assn	50	17	261	25	810
William Budge Memorial Hospital	Gen	NP Assn	63	14	296	48	3,645
Moab 5,33—Grand Grand County Public Hos- pital	Gen	County	16	4	No data supplied		
Ogden 40 272—Weber Thomas D. Dee Memorial Hospital	Gen	Church	204	36	1,252	147	6,055
Park City 4 281—Summit Park City Miner's Hospital	Gen	NP Assn	50	10	45	20	369
Pavon 3 045—Utah Payson General Hospital	Gen	Indiv	12	2	No data supplied		
Price 4 054—Carbon Price City Hospital	Gen	City	53	12	68	33	892
Provo 14 766—Utah Ald Hospital	Gen	Part	16			10	249
Utah State Hospital	Gen	State	1,070			1,013	325
		Rated capacity	1,066				
Richfield 3 067—Sevier Sevier Valley Hospital	Gen	Part	27	8	109	14	487
St. George 2 434—Washington Washington County Hosp	Gen	Corp	32	5	106	11	560
Salina 1 383—Sevier Salina Hospital	Gen	Corp	20	8	37	6	211
Salt Lake City 140 267—Salt Lake Dr. W. H. Groves Latter Day Saints Hospital	Gen	Church	350	60	1,604	291	8,001
Holy Cross Hospital	Gen	Church	200	42	859	106	3,883
Primary Children's Hosp	Chil	Church	35			22	86
St. Mark's Hospital	Gen	Church	155	13	323	137	3,518
Salt Lake General Hosp	Gen	County	229	23	373	163	3,948
Shriners Hospital for Crip- pled Children	Orth	Frat	20			20	65
Veterans Admin Facility	Gen	Vet	104			101	822
Tremonton 1 009—Box Elder Valley Hospital	Gen	NP Assn	20	8	93	7	450

## Related Institutions

American Fork 3 047—Utah Utah State Training School	McDe	State	372			362	93
		Rated capacity	352				
Murray 5 172—Salt Lake Cottonwood Stake Mater- nity Hospital	Mat	Church	23	20	469	13	515
Provo 14 766—Utah Crane Maternity Hos pital	Mat	Indiv	16	16	301	10	201
Spanish Fork 3 72—Utah Hughes Memorial Hospital	Gen	Indiv	8	3	9	2	160
Vernal 1 744—Utah Clark Hospital	Gen	Indiv	14	6	52	4	167

<b>Summary for Utah</b>							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	27	2,956	2,295	37,402			
	5	43	392	1,256			
Totals	32	3,375	2,687	38,658			
Refused registration	0						

## VERMONT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Barre 11 307—Washington Barre City Hospital	Gen	Corp	50	15	216	42	1,405
Washington County Sanat	TB	State	47			40	1,405
Bellows Falls 3,930—Windham Rockingham General Hosp	Gen	NP Assn	37	7	144	34	2,050
Bennington 7 890—Bennington Henry W. Putnam Memo- rial Hospital	Gen	NP Assn	86	20	185	45	1,185
Brattleboro 8 709—Windham Brattleboro Memorial Hos- pital	Gen	NP Assn	50	5	35	51	961
Brattleboro Retreat	Ment	NP Assn	800			712	405
Burlington 24 789—Chittenden Bishop DeGoesbriand Hos- pital	Gen	Church	110	12	256	90	3,935
Green Mountain Sanat	Int Med	Indiv	14			6	169
Lakeview Sanatorium	N & M	Corp	25			9	45
Mary Fletcher Hospital	Gen	NP Assn	135	15	440	116	7,508
Ft. Ethan Allen 100—Chittenden Station Hospital	Gen	Army	158			118	991
Hardwick 1 667—Caledonia Hardwick Hospital	Gen	NP Assn	12	6	20	5	166
Middlebury 2 003—Addison Porter Memorial Hospital	Gen	NP Assn	45	10	50	15	681
Montpelier 7 837—Washington Henton Hospital	Gen	NP Assn	70	8	106	54	1,395
Morrisville 1 822—Lamoille Copley Hospital	Gen	NP Assn	33	5	87	16	611
Newport 5 094—Orleans Orleans County Memorial Hospital	Gen	Corp	30	6	61	16	500
Pittsford 637—Rutland Vermont Sanatorium	TB	State	80			70	115
Proctor 2 515—Rutland Proctor Hospital	Gen	NP Assn	35	7	42	4	447
Randolph 1 957—Orange Gifford Memorial Hospital	Gen	NP Assn	48	10	85	25	755
Rutland 17 315—Rutland Rutland Hospital	Gen	NP Assn	129	16	351	86	3,001
St. Albans 8 020—Franklin St. Albans Hospital	Gen	NP Assn	47	9	145	41	1,550
Sherwood Sanitarium	Gen	Indiv	10			10	574
St. Johnsbury 7 920—Caledonia Brightlook Hospital	Gen	NP Assn	55	10	102	56	1,101
St. Johnsbury Hospital	Gen	Church	30	5	30	13	343
Springfield 4 043—Windsor Springfield Hospital	Gen	NP Assn	30	6	121	19	665
Waterbury 1 776—Washington Vermont State Hospital for the Insane	Ment	State	1,035			1,050	339
		Rated capacity	737				
Winooski 5 308—Chittenden Fanny Allen Hospital	Gen	Church	75	10	150	65	1,585

## Related Institutions

Bennington 7 890—Bennington Vermont Soldiers Home	Inst	State	25			1	39
Brandon 2 891—Rutland Brandon State School	McDe	State	300			255	24
		Rated capacity	300				
Pittsford 637—Rutland Caverly Preventorium	TB	NP Assn	77			71	155
Windsor, 8 689—Windsor Vermont State Prison Hosp	Inst	State	12			6	101
Windsor Hospital	Gen	Corp	18	4	45	4	211

<b>Summary for Vermont</b>							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	27	3,371	2,756	39,555			
	5	450	367	506			
Totals	32	3,751	3,123	40,061			
Refused registration	2	25					

## VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Arlington 2,857—Washington Johnston Memorial Hosp	Gen	NP Assn	60	5	35	23	1,254
Alexandria 24 149—Arlington Alexandria Hospital	Gen	NP Assn	100	16	405	80	550
Bedford 3 713—Bedford Hartwell Hospital	Gen	Indiv	18	2	11	12	54
John Russell Hospital	Gen	Corp	21	2	16	10	55
Bristol 8 840—Washington King's Mountain Memorial Hospital	Gen	NP Assn	50	3	105	23	1,257
Brook Hill 50—Henrico Pine Camp Hospital	TB	City	250			150	215
Burkeville 755—Nottoway Piedmont Sanat (col)	TB	State	150			150	55
Catawba Sanatorium 100—Roanoke Catawba Sanatorium	TB	State	340			222	45
Charlottesville 15,245—Albemarle Blue Ridge Sanatorium	TB	State	250			250	45

Key to symbols and abbreviations is on page 985



## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Martha Jefferson Hospital and Sanitarium	Gen	NPA'ssn	50	10	17	29	1 318
University of Virginia Hospital**	Gen	State	338	40	610	266	8 173
Christiansburg 190—Montgomery	Gen	NPA'ssn	20	5	69	16	984
New Altamont Hospital	Gen	NPA'ssn	20	5	69	16	984
Clifton Forge 6539—Alleghany	Gen	NPA'ssn	130	8	60	92	3 113
Chesapeake and Ohio Railway Hospital*	Gen	NPA'ssn	130	8	60	92	3 113
Chantwood 729—Dickenson	Gen	Indiv	20	3	48	8	1 920
Dickenson County Hospital	Gen	Indiv	20	3	48	8	1 920
Coeburn 784—Wise	Gen	Part	50	2	17	16	400
Coeburn Hospital	Gen	Part	50	2	17	16	400
Corlington 6538—Alleghany	Gen	Indiv	15	4	32	11	300
Covington General Hosp	Gen	Indiv	15	4	32	11	300
Dante 600—Russell	Gen	Corp	25	2		15	670
Clinchfield Hospital	Gen	Corp	25	2		15	670
Danville 22 247—Pittsylvania	TB	NPA'ssn	60			50	120
Hilltop Sanatorium	Gen	NPA'ssn	115	12	347	77	3 901
Memorial Hospital	Gen	NPA'ssn	115	12	347	77	3 901
Farmville 3 132—Prince Edward	Gen	NPA'ssn	50	10	70	32	1 530
Southside Community Hosp	Gen	NPA'ssn	50	10	70	32	1 530
Ft Belvoir—Fairfax	Gen	Army	40	1		13	620
Station Hospital	Gen	Army	40	1		13	620
Ft Myer 1 000—Arlington	Gen	Army	72			51	2 146
Station Hospital	Gen	Army	72			51	2 146
Fortress Monroe 1 000—Elizabeth City	Gen	Army	90	6	75	68	1 614
Station Hospital	Gen	Army	90	6	75	68	1 614
Franklin 2 930—Southampton	Gen	Indiv	30	5	54	19	506
Relford Hospital	Gen	Indiv	30	5	54	19	506
Fredericksburg 6 519—Spotsylvania	Gen	NPA'ssn	70	10	270	50	2 202
Mary Washington Hospital	Gen	NPA'ssn	70	10	270	50	2 202
Galax 2 044—Grayson	Gen	Corp	30	3	34	20	563
Galax Hospital and Clinic	Gen	Corp	30	3	34	20	563
Hampton 6 382—Elizabeth City	Gen	NPA'ssn	70	10	143	20	1 287
Dixie Hospital	Gen	NPA'ssn	70	10	143	20	1 287
Harrisonburg 7 232—Rockingham	Gen	NPA'ssn	120	10	221	112	4 087
Rockingham Mem Hosp	Gen	NPA'ssn	120	10	221	112	4 087
Hopewell 11 327—Prince George	Gen	Corp	18	5	48	7	367
John Randolph Hospital	Gen	Corp	18	5	48	7	367
Hot Springs 1 500—Bath	Gen	NPA'ssn	13	4	9	5	161
Community House	Gen	NPA'ssn	13	4	9	5	161
Keocoughtan—Elizabeth City	Gen	Vet	16			44	1 432
Veterans Admin Facility	Gen	Vet	16			44	1 432
Langley Field—Elizabeth City	Gen	Army	50			32	1 183
Station Hospital	Gen	Army	50			32	1 183
Leesburg 1 640—Loudoun	Gen	County	28	6	76	10	662
Loudoun County Hospital	Gen	County	28	6	76	10	662
Levington 3 702—Rockbridge	Gen	NPA'ssn	42	8	45	20	1 384
Stonewall Jackson Memorial Hospital	Gen	NPA'ssn	42	8	45	20	1 384
Luray 1 400—Page	Gen	NPA'ssn	12	3	20	3	193
Page Memorial Hospital	Gen	NPA'ssn	12	3	20	3	193
Lynchburg 40 661—Campbell	Gen	City	102	10	243	83	2 616
Guggenheimer Memorial Hospital	Gen	City	102	10	243	83	2 616
Lynchburg General Hosp	Gen	City	102	10	243	83	2 616
Marshall Lodge Memorial Hospital	Gen	City	102	10	243	83	2 616
Virginia Baptist Hospital	Gen	Church	102	10	243	83	2 616
Marion 4 156—Smyth	Gen	Church	102	10	243	83	2 616
Southwestern State Hosp	Gen	State	1 220			1 196	461
Rated capacity 1 347							
Nassawadox 1 000—Northampton	Gen	County	50	5	76	25	1 001
Northampton Accomac Memorial Hospital	Gen	County	50	5	76	25	1 001
Newport News 34 417—Warwick	Gen	Indiv	90	10	167	51	2 760
Elizabeth Buxton Hospital	Gen	Indiv	90	10	167	51	2 760
Riverside Hospital	Gen	NPA'ssn	100	14	364	54	2 331
Whittaker Memorial Hospital (col)	Gen	NPA'ssn	44	6	13	13	433
Norfolk 129 710—Norfolk	TB	City	100			88	101
Charles R Grandy Sanat	TB	City	100			88	101
Henry A Wise Hospital for Contagious Diseases	Iso	City	30			No data supplied	
Hospital of St Vincent de Paul	Gen	Church	228	22	215	122	4 140
Leigh Memorial Hospital	Gen	NPA'ssn	50	12	130	27	1 261
Norfolk Community Hospital (col)	Gen	NPA'ssn	28	5	50	17	521
Norfolk General Hosp**	Gen	NPA'ssn	200	30	663	190	7 170
U S Marine Hospital*	Gen	USPHS	360			269	3 270
Norton 3 077—Wise	Gen	Indiv	30	2	6	10	606
Norton Hospital	Gen	Indiv	30	2	6	10	606
Pennington Gap 1 533—Lee	Gen	Corp	30	2	21	21	861
Lee General Hospital	Gen	Corp	30	2	21	21	861
Petersburg 28 064—Dinwiddie	Gen	State	340			340	909
Central State Hosp (col)	Gen	State	340			340	909
Rated capacity 340							
Medical Center Hospital	Gen	Unit of Central State Hospital	72	7	94	44	1 732
Petersburg Hospital	Gen	NPA'ssn	72	7	94	44	1 732
Portsmouth 4 701—Norfolk	Gen	NPA'ssn	90	10	204	64	1 938
Kings Daughters Hospital	Gen	NPA'ssn	90	10	204	64	1 938
Norfolk Naval Hospital*	Gen	Navy	432	11	57	370	3 241
Parrish Memorial Hospital	Gen	Corp	40	10	133	24	1 031
Pulaski 7 165—Pulaski	Gen	Corp	30	5	86	27	1 012
Pulaski Hospital	Gen	Corp	30	5	86	27	1 012
Radford 6 027—Montgomery	Gen	NPA'ssn	40			36	334
St Albans Sanatorium	Gen	NPA'ssn	40			36	334
Richlands 1 300—Tazewell	Gen	Indiv	60	1	46	40	1 760
Mattie Williams Hospital	Gen	Indiv	60	1	46	40	1 760
Richmond 182 000—Henrico	Gen	Unit of Medical College of Va Hosp Division					
Crippled Children's Hosp	Gen	Unit of Medical College of Va Hosp Division					

## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Dooley Hospital	Gen	Unit of Medical College of Va Hosp Division	120	18	20	393	9 900
Grace Hospital	Gen	Corp	120	18	20	393	9 900
Johnston Willis Hospital*	Gen	Corp	120	18	20	393	9 900
Medical College of Virginia Hospital Division**	Gen	NPA'ssn	423	18	330	393	9 900
Memorial Hospital	Gen	Unit of Medical College of Va Hosp Division	120	18	20	393	9 900
Retreat for the Sick	Gen	NPA'ssn	120	18	20	393	9 900
Richmond Community Hospital (col)	Gen	NPA'ssn	28	6	71	7	363
St Elizabeth's Hospital	Gen	Corp	20		3	39	1 308
St Luke's Hospital	Gen	Corp	74	12	218	34	2 005
St Philip Hosp (col)	Gen	Unit of Medical College of Va Hosp Division	68	7	119	65	1 145
Sheltering Arms Hospital	Gen	NPA'ssn	90	18	232	63	2 862
Stuart Circle Hospital*	Gen	Corp	90			29	450
Tucker Sanatorium	Gen	NPA'ssn	100			100	412
Westbrook Sanatorium	Gen	NPA'ssn	100			100	412
Roanoke 69 206—Roanoke	Gen	NPA'ssn	38	3	No data supplied		
Burrill Memorial Hospital (col)	Gen	NPA'ssn	38	3	No data supplied		
Glenn Memorial Eye Ear and Throat Hospital	ENT	NPA'ssn	20			6	100
Jefferson Hospital*	Gen	NPA'ssn	110	12	134	72	2 063
Lewis Gale Hospital	Gen	NPA'ssn	64	6	74	57	3 329
Roanoke Hospital	Gen	NPA'ssn	98	12	220	49	1 908
Shenandoah Hospital	Gen	Corp	60	8	112	20	1 442
Veterans Admin Facility	Vet	Vet	633			507	404
Salem 4 833—Roanoke	TB	Indiv	20			18	01
Mount Regis Sanatorium	TB	Indiv	20			18	01
Salville 2 964—Smyth	Gen	Corp	15	3	8	7	349
Mathieson Hospital	Gen	Corp	15	3	8	7	349
South Boston 4 841—Halifax	Gen	Indiv	36	4	02	21	843
South Boston Hospital	Gen	Indiv	36	4	02	21	843
Staunton 11 990—Augusta	Gen	NPA'ssn	60	10	104	42	1 330
Kings Daughters Hospital	Gen	NPA'ssn	60	10	104	42	1 330
Stuart 588—Patrick	Gen	Indiv	20	4	15	8	206
Stuart Hospital	Gen	Indiv	20	4	15	8	206
Suffolk 10 271—Nansemond	Gen	Corp	30	6	14	20	886
Lakeview Hospital	Gen	Corp	30	6	14	20	886
Virginia General Hospital	Gen	NPA'ssn	20	10	29	20	366
University—Albemarle	Gen	NPA'ssn	20	10	29	20	366
University of Virginia Hospital**	See Charlottesville						
Warrenton 1 400—Fauquier	Gen	NPA'ssn	28	5	98	10	603
Fauquier County Hospital	Gen	NPA'ssn	28	5	98	10	603
Waynesboro 6 226—Augusta	Gen	NPA'ssn	30	5		Etab	1937
Waynesboro General Hosp	Gen	NPA'ssn	30	5		Etab	1937
Williamsburg 3 778—James City	Gen	Indiv	17	2	19	6	370
Bell Hospital	Gen	Indiv	17	2	19	6	370
Eastern State Hospital	Gen	State	1 600			1 630	470
Rated capacity 1 600							
Winchester 10 805—Frederick	Gen	NPA'ssn	100	19	221	67	2 643
Winchester Memorial Hosp	Gen	NPA'ssn	100	19	221	67	2 643
Related Institutions							
Beaumont—Powhatan	Inst	State	18			0	446
Virginia Industrial School for Boys	Inst	State	18			0	446
Clover 251—Halifax	Gen	Indiv	6	2	33	1	86
Little Retreat Hospital	Gen	Indiv	6	2	33	1	86
Colony 100—Amherst	Gen	State	1 200			1 184	261
State Colony for Epileptics and Feeble-minded	Gen	State	1 200			1 184	261
Rated capacity 1 200							
Danville 22 247—Pittsylvania	Gen	Corp	39	5	17	8	439
Providence Hospital (col)	Gen	Corp	39	5	17	8	439
Falls Church 2 019—Fairfax	Gen	Indiv	65			80	10
Gundry Home and Training School for Feeble-minded	MeDe	Indiv	65			80	10
Lawrenceville 1 629—Brunswick	Inst	Church	17			1	00
Louie Taylor Letcher Memorial Hospital (col)	Inst	Church	17			1	00
Martinsville 7 700—Henry	Gen	Indiv	14	2	5	3	130
St Mary Hospital (col)	Gen	Indiv	14	2	5	3	130
Shackelford Hospital	Gen	Indiv	14	2	5	3	130
Norfolk 129 710—Norfolk	ENT	Part	13			3	312
McCoy Stokes Hospital	ENT	Part	13			3	312
Richmond 182 929—Henrico	Inst	City	100	28	113	406	1 062
City Home	Inst	City	100	28	113	406	1 062
Convalescent Home Hosp	Conv	Indiv	40	2	No data supplied		
Lee Camp Soldiers Home	Inst	State	30			10	8
Hospital	Inst	State	30			10	8
Penitentiary Hospital	Inst	State	44			24	660
State Farm 60—Goochland	Inst	State	120			62	992
State Farm Hospital	Inst	State	120			62	992
Staunton 11 990—Augusta	Gen	State	2 700			2 008	1 201
Western State Hospital	Gen	State	2 700			2 008	1 201
Rated capacity 2 400							
Stonegap 201—Wise	Indus	NPA'ssn	16			7	107
Stonewall Hospital	Indus	NPA'ssn	16			7	107
Sweet Briar 200—Amherst	Inst	NPA'ssn	10			2	220
Sweet Briar College Infirmary	Inst	NPA'ssn	10			2	220
Summary for Virginia							
Hospitals and Sanatoriums	90	14 998	12 453	129 707			
Related institutions	17	4 762	4 110	7 292			
Totals	107	19 760	16 563	146 999			
Refused registration	1	8					

Key to symbols and abbreviations is on page 986

## WASHINGTON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aberdeen 21723—Grays Harbor	Gen	Corp	60			53	2 270
Aberdeen General Hospital	Gen	Church	60	20	449	51	1 961
St Joseph's Hospital	Gen	Church					
American Lake 800—Pierce	Gen	Corp					
Veterans Admin Facility	Ment	Vet	710			685	213
Anacortes 6564—Skagit	Gen	Corp	24	4	63	10	374
Anacortes Hospital	Gen	Corp					
Auburn 3906—King	Gen	Corp	40	6	52	13	500
Suburban Hospital	Gen	Corp					
Bellingham 30823—Whatcom	Gen	Indiv	17	4	54	6	1 50
St Frances Hospital	Gen	Church	100	15	294	65	1 758
St Joseph's Hospital	Gen	Church	100	15	294	65	1 758
St Luke's General Hosp	Gen	NPA'sn	70	12	2 11	50	1 878
Bremerton 10170—Kitsap	Gen	Nav	200	5	32	131	1 620
U S Naval Hospital	Gen	Nav					
Centralia 8008—Lewis	Gen	Part	20	8	127	12	564
St Luke's Hospital and Sweet Clinic	Gen	Part					
Chehalis 4907—Lewis	Gen	Church	20	8	129	10	611
St Helen's Hospital	Gen	Church					
Chevelah 1315—Stevens	Gen	Church	20	6	68	14	442
St Joseph's Hospital	Gen	Church					
Colfax 2752—Whitman	Gen	Church	60	10	160	50	1 869
St Ignatius Hospital	Gen	Church					
Colville 1803—Stevens	Gen	Part	20	6	No data supplied		
Mt Carmel Hospital	Gen	Part					
Dayton 2528—Columbia	Gen	Indiv	19	4	71	12	462
John Brining Memorial Hosp	Gen	Indiv					
Ellensburg 4621—Kittitas	Gen	Corp	20	8	100	14	962
Ellensburg General Hospital	Gen	Corp					
Elma 1540—Grays Harbor	Gen	Indiv	16	5	31	6	1 990
Conway Hospital	Gen	Indiv					
Oakhurst Sanatorium	TB	County	65			66	100
Everett 30567—Snohomish	Gen	NPA'sn	84	16	299	58	2 610
General Hospital	Gen	Church	104	10	2 16	37	1 657
Providence Hospital	Gen	Church					
Forks 600—Clallam	Gen	Part	21	3	37	7	3 38
Olympic Hospital	Gen	Part					
Ft Lewis—Pierce	Gen	Army	157	6	73	96	2 762
Station Hospital	Gen	Army					
Ft Steilacoom 2080—Pierce	Ment	State	2 413			2 410	769
Western State Hospital	Ment	State	2 413			2 410	769
Ft Worden (Port Townsend P O)	Gen	Army	40			16	320
Station Hospital	Gen	Army					
Hoquiam 12766—Grays Harbor	Gen	Corp	50	12	142	26	1 368
Hoquiam General Hospital	Gen	Corp					
Kirkland 1714—King	Gen	Indiv	12	4	49	4	204
Kirkland Hospital	Gen	Indiv					
Lakeview 300—Pierce	TB	County	142			110	228
Mountain View Sanatorium	TB	County					
Leavenworth 1415—Chelan	Gen	NPA'sn	30	6			
Cascade Sanatorium	Gen	NPA'sn					
Longview 1062—Cowlitz	Gen	NPA'sn	45	14	200	22	1 100
Cowlitz General Hospital	Gen	NPA'sn					
Longview Memorial Hosp	Gen	Corp	80	16	No data supplied		
Mason City—Okanogan	Gen	NPA'sn	78	12	192	55	1 953
Washington Hospital	Gen	NPA'sn					
Medical Lake 1671—Spokane	Ment	State	1 750			1 669	380
Eastern State Hospital	Ment	State	1 750			1 669	380
Mt Vernon 3690—Skagit	Gen	Indiv	30	6	61	10	559
Mt Vernon General Hosp	Gen	Indiv					
Nespelem 125—Okanogan	Gen	IA	39	5	03	32	1 438
Colville Hospital	Gen	IA					
Newport 1080—Pend Oreille	Gen	NPA'sn	20	6	50	8	3 30
Newport Community Hosp	Gen	NPA'sn					
Olympia 11733—Thurston	Gen	Church	100	15	240	51	2 200
St Peter's Hospital	Gen	Church					
Oroville 800—Okanogan	Gen	Indiv	15	6	No data supplied		
Oroville General Hospital	Gen	Indiv					
Pasco 3496—Franklin	Gen	Church	58	7	167	39	1 074
Our Lady of Lourdes Hos	Gen	Church					
pital	Gen	Church					
Pt Angeles 1018—Clallam	Gen	Part	50	10	76	21	1 013
Davidson and Hay Hospital	Gen	Part					
Pt Angeles General Hosp	Gen	NPA'sn	90	10	147	70	2 782
Pt Gamble—Kitsap	Gen	Indiv	15	2	24	6	198
McCormick General Hosp	Gen	Indiv					
Pt Townsend 3979—Jefferson	Gen	Church	86	9	86	31	607
St John's Hospital	Gen	Church					
Puyallup 7094—Pierce	Gen	Corp	26			19	100
Puget Sound Sanatorium	N&M	Corp					
Renton 4062—King	Gen	Indiv	28	6	102	7	312
Renton Hospital	Gen	Indiv					
Richmond Highlands 600—King	Tb Iso	City	2 00			234	339
Firland Sanatorium and Iso	Tb Iso	City					
lation Hospital	Tb Iso	City					
Seattle 360583—King	Gen	NPA'sn	32	12	147	18	929
Ballard Accident and Gen	Gen	NPA'sn					
eral Hospital	Gen	NPA'sn					
Children's Orthopedic Hos	Orth	NPA'sn	134			114	1 320
pital	Orth	NPA'sn					
Columbus Hospital	Gen	Church	200	30	394	80	2 800
Firland Sanatorium	N&M	Corp	12			Estab	1937
King County Hospital Unit	Gen	County	394	51	801	328	10 403
No 1 (Harborview)*	Gen	County					
King County Tuberculosis	TB	County	165			108	136
Hospital	TB	County					
Laurel Beach Sanatorium	TB	Part	80			62	209
Maynard Hospital	Gen	NPA'sn	101	30	500	77	2 710
Meadows Sanatorium	N&M	Corp	35			15	100

## WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Providence Hospital*	Gen	Church	330	40	860	200	7 691
Riverton Sanatorium	FB	NPA'sn	60			00	08
St Luke's Hospital	Gen	Corp	46	10	1 11	20	1 080
Seattle General Hospital*	Gen	NPA'sn	100	20	374	14	893
Station Hospital	Gen	Army	28			8	294
Swedish Hospital*	Gen	NPA'sn	190	60	002	163	5 341
U S Marine Hospital*	Gen	USPHS	400			001	3 000
Virginia Mason Hospital*	Gen	NPA'sn	140	00	442	102	4 077
Sedro Woolley 2719—Skagit	Gen	NPA'sn	30	10	123	10	508
Memorial Hospital	Gen	NPA'sn					
Northern State Hospital and State Narcotic Farm Col ony	Ment	State	1 778			1 669	400
Rated capacity			1 500				
Shelton 3091—Mason	Gen	NPA'sn	40	15	149	28	1 020
Shelton General Hospital	Gen	NPA'sn					
Snohomish 2688—Snohomish	TB	County	57			40	40
Aldercrest Sanatorium	TB	County					
Snohomish General Hosp	Gen	Indiv	14	4	63	7	2 10
South Bend 1798—Pacific	Gen	Part	30	5	40	12	230
South Bend General Hosp	Gen	Part					
Spokane 11014—Spokane	Gen	Church	227	30	626	120	4 900
Deaconess Hospital*	Gen	Church	148			117	119
Edgelliff Sanatorium*	TB	County	294	40	1 048	264	9 060
Sacred Heart Hospital*	Gen	Church	170	18	287	118	3 388
St Luke's Hospital*	Gen	NPA'sn					
Shriners Hospital for Crip	Orth	Frat	20			90	110
pled Children	Orth	Frat					
Station Hospital	Gen	Army	90	2	9	43	893
Stanwood 715—Snohomish	Gen	Indiv	14	3	30	6	1 10
Stanwood General Hospital	Gen	Indiv					
Tacoma, 106817—Pierce	Gen	Indiv					
Northern Pacific Beneficial	Gen	NPA'sn	111	9	40	63	9 411
Association Hospital	Gen	NPA'sn	198	22	336	1 00	3 287
Pierce County Hospital*	Gen	County	300	50	561	84	3 960
St Joseph's Hospital*	Gen	Church	100	30	896	117	4 330
Tacoma General Hospital*	Gen	NPA'sn	280			230	860
Tacoma Hospital	G&TB	IA					
Toppenish 2774—Yakima	TB	IA	37			00	80
Yakima Sanatorium	TB	IA					
Vancouver 15766—Clark	Gen	County	37	8	61	31	600
Clark County Hospital	Gen	County					
Clark General Hospital	Gen	NPA'sn	40	12	198	00	961
St Joseph's Hospital	Gen	Church	120	14	127	40	1 773
Station Hospital	Gen	Army	109			40	1 314
Walla Walla 15976—Walla Walla	Gen	Church	70	20	201	63	2 329
St Mary's Hospital	Gen	Church	400			336	1 461
Veterans Admin Facility	G&TB	Vet					
Walla Walla Sanitarium and	Gen	Church	50	9	118	24	726
Hospital	Gen	Church					
Wenatchee 11627—Chelan	Gen	Church	50	14	208	40	1 440
Central Washington Dea	Gen	Church	60	16	208	38	1 403
coness Hospital	Gen	Church					
St Anthony's Hospital	Gen	Church					
Yakima 27101—Yakima	Gen	Church	100	30	738	100	4 643
St Elizabeth's Hospital	Gen	Church					
Yakima County Hospital	Gen	County	40	13	19	28	800

## Related Institutions

Chehalis 4907—Lewis	Inst	State	46			5	862
State Training Schools for Boys	Inst	State					
Cle Elum 2508—Kittitas	Gen	NPA'sn	21	1	5	14	409
Roslyn Cle Elum Beneficial	Gen	NPA'sn					
Company Hospital	Gen	NPA'sn					
Ione 594—Pend Oreille	Gen	Indiv	9	4	33	5	003
Ione Hospital	Gen	Indiv					
Medical Lake 1671—Spokane	McDe	State	1 000			1 000	116
State Custodial School	McDe	State	1 000			1 000	116
Rated capacity, 1 300							
Monroe 1570—Snohomish	Gen	Indiv	13	4	20	4	160
Monroe General Hospital	Gen	Indiv					
Snohomish County Hospital	Inst	Gen	32	5	3	23	1 00
and Farm	Inst	Gen					
Mt Vernon 3690—Skagit	Gen	Indiv	40	10	113	18	600
Rowley General Hospital	Gen	Indiv					
Seattle 360583—King	Mat	NPA'sn	20	15	32	00	00
Florence Crittenton Home	Conv	Indiv	11			3	00
Fredlanders Sanitarium	Conv	Indiv					
Junior League Convalescent	Conv	NPA'sn	20			15	74
Home	Conv	NPA'sn					
King County Hospital Unit	Inst	Chr	270			261	720
No 2 (Georgetown Branch)	Inst	Chr					
University of Washington	Inst	State	70			12	1 00
Health Service Infirmary	Inst	State					
Spangle 218—Spokane	Inst	County	130			110	416
Spokane County Hospital	Inst	County					
Spokane 115514—Spokane	Mat	NPA'sn	20	6	26	14	60
Florence Crittenton Home	Mat	NPA'sn					
Rivercrest Hospital	Mat	NPA'sn	100			No data supplied	
Salvation Army Women's	Mat	Church	40	30	00	20	134
Hospital and Home	Mat	Church					
Sprague 639—Lincoln	Gen	Indiv	10	5	10	2	61
Sprague Hospital	Gen	Indiv					
Stellacoom 722—Pierce	Inst	Fed	84			61	703
United States Penitentiary	Inst	Fed					
Ho pital	Inst	Fed					
Sumas 647—Whatcom	Gen	Indiv	12	2	5	1	20
Sumas General Hospital	Gen	Indiv					
Tacoma 106817—Pierce	Gen	NPA'sn	14			10	1 00
Washington Minor Hospital	Gen	NPA'sn					
White Shield Home	Mat	NPA'sn	20	10	37	10	1 00

Key to symbols and abbreviations is on page 986

WASHINGTON—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Tulalip 100—Snohomish Tulalip Hospital	Gen	IA	9	4	39	9	210
Walla Walla 10 976—Walla Walla Blue Mountain Sanatorium	LB	County	32			20	40
Yakima 27 101—Yakima Cottage Hospital	Gen	Indiv	15	12	390	5	406

Summary for Washington

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	92	15 293	12 230	143 650
Related institutions	24	2 608	2 190	9 024
Totals	116	17 901	14 420	152 674
Refused registration	21	40		

WEST VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Beckley 9 357—Raleigh Beckley Hospital	Gen	Part State	150	20	80	126	8 962
Pinecrest Sanitarium	LB	State	148			146	129
Raleigh General Hospital	Gen	Corp	60	4	46	41	1 479
Bluefield 19 339—Mercer Bluefield Sanitarium	Gen	Corp	100	6	140	84	4 118
Brown's Hospital (col)	Gen	Indiv	40	3	11	16	
Providence Hospital (col)	Gen	Indiv	20	3	2	10	494
St Luke's Hospital	Gen	Corp	75	8	80	50	1 697
Buckhannon 4 374—Upshur St Joseph's Hospital	Gen	Church	30	6	51	22	509
Charleston 60 408—Kanawha Charleston General Hosp	Gen	NPA'sn	200	20	20	163	6 760
Kanawha Valley Hospital	Gen	Corp	132	12		104	
McMillan Hospital	Gen	Corp	90	10	131	49	2 459
Mountain State Hospital	Gen	Corp	77	12	189	53	4 000
St Francis Hospital	Gen	Church	90	14	232	61	2 661
Salvation Army Hospital	Gen	Church	28	4	61	15	561
Staats Hospital	Gen	Corp	46	3	50	38	1 879
Charles Town 2 434—Jefferson Charles Town General Hosp	Gen	NPA'sn	26	6	40	10	397
Clarksburg 28 866—Harrison St Mary's Hospital	Gen	Church	100	12	149	74	3 162
Union Protestant Hosp	Gen	NPA'sn	50	10	169	30	1 634
Elkins 7 345—Randolph Davis Memorial Hospital	Gen	NPA'sn	120	10	53	66	2 393
Elkins City Hospital	Gen	Indiv	60	6	35	20	993
Fairmont 23 159—Marion Cook Hospital	Gen	NPA'sn	106	10	188	74	2 731
Fairmont Emergency Hospital	Gen	State	60	5	28	47	3 218
Glen Dale 1 493—Marshall Reynolds Memorial Hosp	Gen	Church	80	10	126	26	892
Hinton 6 634—Summers Hinton Hospital	Gen	Corp	71	4	29	36	1 120
Holden 4 000—Logan Holden Hospital	Gen	NPA'sn	30	1	4	12	640
Hopewell 300—Preston Conley Hospital	Unit of Hopewell Sanitarium	State	475			410	289
Hopewell Sanitarium	TB	State					
Huntington 75 572—Cabell Chesapeake and Ohio Railway Hospital	Gen	NPA'sn	110	20	58	96	2 746
Huntington City Hospital	Gen	City	30	4	No data supplied		
Huntington Memorial Hospital	Gen	NPA'sn	115	6	69	44	1 790
Huntington Orthopedic Hospital	Orth	NPA'sn	50			35	820
Moore-Beckner Eye Ear and Throat Hospital	ENT	Indiv	5			3	417
St Mary's Hospital	Gen	Church	110	24	540	112	3 840
Veterans Admin Facility	Gen	Vet	210			188	1 821
Kenova 3 680—Wayne Rife-Ferguson Hospital	Gen	Part	10	2	10	4	120
Keyser 6 248—Mineral Potomac Valley Hospital	Gen	Corp	50	8	81	31	1 169
Lakin 50—Mason Lakin State Hosp (col)	Ment	State	410			309	127
Logan 4 396—Logan Logan General Hospital	Gen	Corp	100	8	51	57	2 490
Mercy Hospital	Gen	Part	70	10	44	54	1 903
Marlinton 1 586—Pocahontas Pocahontas Memorial Hosp	Gen	County	40	3	No data supplied		
Martinsburg 14 837—Berkeley City Hospital	Gen	NPA'sn	100	6	38	50	1 036
Kings Daughters Hospital	Gen	NPA'sn	65	8	107	34	1 202
Matewan 932—Mingo Matewan Clinic Hospital	Gen	Indiv	42	1	52	12	4 370
McKendree 80—Fayette McKendree Emergency Hospital	Gen	State	60	3	19	40	609
Montgomery 2 006—Fayette Laird Memorial Hospital	Gen	Corp	130	12	72	54	3 470
Morgantown 16 186—Monongalia City Hospital	Gen	Indiv	57	7	90	32	1 200
Eastmont Tuberculosis Sanatorium	TB	NPA'sn	70			24	30
Monongalia County Hosp	Gen	County	70	8	106	48	1 566

WEST VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Mullens 2 306—Wyoming Wyllo Hospital	Gen	Indiv	20	2	20		14
New Martinsville 2 814—Wetzel Wetzel County Hospital	Gen	NPA'sn	30	5	39	20	790
Oak Hill 2 076—Fayette Oak Hill Hospital	Gen	Part	50	5	23	28	2 135
Parkersburg 29 623—Wood Camden Clark Memorial Hospital	Gen	City	104	18	183	58	1 700
St Joseph's Hospital	Gen	Church	150	10	220	79	2 636
Philippi 1 767—Barbour Myers Clinic Hospital	Gen	Part	40	3	21	23	1 040
Princeton 6 905—Mercer Mercer Memorial Hospital	Gen	Part	37				20
Princeton Hospital	Gen	Corp	40	2	No data supplied		
Richwood 5 720—Nicholas McClung Hospital	Gen	Corp	50	6	24	12	419
Sacred Heart Hospital	Gen	Church	30	6	No data supplied		
Ronceverte 2 204—Greenbrier Greenbrier Valley Hospital	Gen	Corp	50	4	16	32	1 438
South Charleston 5 904—Kanawha Dunn Hospital	Gen	Indiv	12	2	21	3	173
Welch 5 306—McDowell Grace Hospital	Gen	Corp	130	6	84	81	3 440
Stevens Clinic Hospital	Gen	Corp	100	6	76	79	4 142
Welch Emergency Hospital	Gen	State	115	2	30	43	5 203
Weston 8 646—Lewis General Hospital	Gen	Indiv	44	3	27	20	691
Weston City Hospital	Gen	Corp	20	7	27	12	546
Wheeling 61 609—Ohio Ohio Valley General Hosp	Gen	NPA'sn	200	22	568	203	5 942
Wheeling Hospital	Gen	Church	300	30	510	139	3 630
Williamson 9 410—Mingo Williamson Mem Hospital	Gen	Corp	90	5	68	51	2 405

Related Institutions

Berkeley Springs 1 039—Morgan The Pines West Virginia Foundation for Crippled Children	Orth	NPA'sn	20			20	38
Charleston 60 408—Kanawha Hill Crest Sanatorium	TbChil	NPA'sn	40			33	26
Huntington 75 572—Cabell Huntington State Hospital	Ment	State	908			891	482
Milton 1 305—Cabell Morris Memorial Hospital for Crippled Children	Conv	NPA'sn	40				
Moundsville 14 411—Marshall Grand View Sanatorium	TB	County	30			24	36
West Virginia Penitentiary Hospital	Inst	State	74			No data supplied	
St Marys 2 180—Pleasants West Virginia Training School	MeDe	State	83			84	4
Spencer 2 493—Roane De Puc Hospital	Gen	Indiv	20	2	33	10	401
Spencer State Hospital	Ment	State	897			885	240
Weston 8 646—Lewis Weston State Hospital	Ment	State	1 616			1 574	674
Wheeling 61 609—Ohio Florence Crittenton Home	Mat	NPA'sn	46	2		1	20
Ohio County Tuberculosis Sanatorium	TB	County	38			38	77

Summary for West Virginia

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	67	6 092	4 066	127 073
Related institutions	12	4 010	3 639	2 705
Totals	79	10 102	7 700	129 778
Refused registration	3	92		

WISCONSIN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Algoma 2 202—Kewaunee Algoma Hospital	Gen	NPA'sn	12	4	31	4	166
Amery 1 354—Polk Amery Hospital	Gen	Indiv	10	5	23	6	279
Antigo 8 610—Langlade Langlade County Memorial Hospital	Gen	Church	50	10	10	41	1 094
Appleton 2 267—Outagamie St Elizabeth Hospital	Gen	Church	200	30	629	107	3 579
Arcadia 1 499—Trempealeau St Joseph's Hospital	Gen	Church	20	6	31		140
Ashland 10 622—Ashland Ashland General Hospital	Gen	NPA'sn	67	8	102	40	1 149
St Joseph's Hospital	Gen	Church	135	10	298	78	2 072
Baldwin 808—St Croix Baldwin Community Hosp	Gen	NPA'sn	15	6	28	8	193
Baraboo 5 340—Sauk St Mary's Ringling Hosp	Gen	Church	40	10	108	14	991

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Beaver Dam 9 867—Dodge	Gen	Church	43	12	184	22	1 094
Lutheran Deaconess Hosp	Gen	Church	43	12	184	22	1 094
Beloit 23 611—Rock	Gen	City	80	28	410	48	2 131
Beloit Municipal Hospital	Gen	City	80	28	410	48	2 131
Berlin 4 106—Green Lake	Gen	NP Assn	15	5	54	10	330
Black River Falls 1 950—Jackson	Gen	NP Assn	15	5	54	10	330
Krohn Clinic and Hospital	Gen	Part	21	10	161	20	691
Boscobel 1 762—Grant	Gen	Part	22	6	19	3	171
Brookside Parker Hospital	Gen	Part	22	6	19	3	171
Burlington 4 114—Racine	Gen	NP Assn	20	10	131	10	704
Memorial Hospital	Gen	NP Assn	20	10	131	10	704
Chippewa Falls 9 539—Chippewa	Gen	Church	140	14	220	80	2 149
St Joseph's Hospital	Gen	Church	140	14	220	80	2 149
Columbus 2 514—Columbia	Gen	Church	40	6	108	17	633
St Mary's Hospital	Gen	Church	40	6	108	17	633
Cumberland 1 532—Barron	Gen	Part	28	6	63	10	397
Cumberland Hospital	Gen	Part	28	6	63	10	397
Darlington 1 764—Lafayette	Gen	Part	10	3	No data supplied		
Drs Quinn and McConnell Hospital	Gen	Part	10	3	No data supplied		
Dodgeville 1 937—Iowa	Gen	NP Assn	22	5	87	15	782
Dodgeville General Hospital	Gen	NP Assn	22	5	87	15	782
St Joseph's Hospital	Gen	Church	50	10	100	28	1 064
Eau Claire 26 287—Eau Claire	Gen	NP Assn	130	20	436	87	3 179
Luther Hospital	Gen	NP Assn	130	20	436	87	3 179
Mt Washington Sanatorium	TB	County	58		58	58	59
Sacred Heart Hospital	Gen	County	100	20	302	86	3 124
Edgerton 2 906—Rock	Gen	NP Assn	18	6	121	10	536
Edgerton Memorial Hospital	Gen	NP Assn	18	6	121	10	536
Elkhorn 2 340—Walworth	Gen	County	41	11	237	34	1 400
Walworth County Hospital	Gen	County	41	11	237	34	1 400
Fond du Lac 26 449—Fond du Lac	Gen	Church	220	32	589	100	5 824
St Agnes Hospital	Gen	Church	220	32	589	100	5 824
Ft Atkinson 5 793—Jefferson	Gen	Indiv	10	5	70	6	300
Ft Atkinson General Hosp	Gen	Indiv	10	5	70	6	300
Frederic 680—Polk	Gen	Indiv	12	4	46	10	446
Frederic Hospital	Gen	Indiv	12	4	46	10	446
Crantsburg 777—Burnett	Gen	Corp	20	4	60	17	607
Community Hospital	Gen	Corp	20	4	60	17	607
Green Bay 37 415—Brown	Gen	Church	79	11	238	54	2 703
Bellin Memorial Hospital	Gen	Church	79	11	238	54	2 703
St Mary's Hospital	Gen	Church	100	22	393	51	3 783
St Vincent's Hospital	Gen	Church	217	20	531	105	7 227
Hartford, 3 704—Washington	Gen	Church	50	8	94	18	783
St Joseph's Hospital	Gen	Church	50	8	94	18	783
Hawthorne 75—Douglas	TB	County	138			131	77
Middle River Sanatorium	TB	County	138			131	77
Hayward 1 207—Sawyer	Gen	IA	40	5	106	38	977
Hayward Indian Hospital	Gen	IA	40	5	106	38	977
Hillsboro 972—Vernon	Gen	Indiv	20	5	No data supplied		
Hansberry Hospital	Gen	Indiv	20	5	No data supplied		
Iola 703—Waupaca	Gen	Corp	18	5	24	10	280
Iola Hospital	Gen	Corp	18	5	24	10	280
Janesville 21 628—Rock	Gen	Church	120	30	308	61	1 939
Veroy Hospital	Gen	Church	120	30	308	61	1 939
Pinehurst Sanatorium	TB	County	68			62	69
Jefferson 2 633—Jefferson	TB	County	4			51	71
Forest Lawn Sanatorium	TB	County	4			51	71
Kaukauna 7 581—Outagamie	TB	County	60			62	78
Riverview Sanatorium	TB	County	60			62	78
Kenosha 50 262—Kenosha	Gen	NP Assn	100	30	390	60	2 519
Kenosha Hospital	Gen	NP Assn	100	30	390	60	2 519
St Catharine's Hospital	Gen	Church	43	12	362	70	1 301
and Sanatorium	Gen	Church	43	12	362	70	1 301
Willowbrook Sanatorium	TB	County	38			36	34
Keshena 500—Shawano	Gen	Church	60	6	106	30	851
St Joseph's Indian Hosp	Gen	Church	60	6	106	30	851
La Crosse 39 614—La Crosse	Gen	NP Assn	106	10	86	42	1 126
Grandview Hospital	Gen	NP Assn	106	10	86	42	1 126
La Crosse Hospital	Gen	NP Assn	40	12	101	30	1 896
La Crosse Lutheran Hosp	Gen	Church	100	4	102	69	2 670
St Francis Hospital	Gen	Church	200	40	636	100	4 989
Lady Smith 3 493—Rusk	Gen	Church	35	5	129	24	917
St Mary's Hospital	Gen	Church	35	5	129	24	917
Lancaster 2 432—Grant	Gen	Indiv	12	6	10	3	90
Godfrey Hospital	Gen	Indiv	12	6	10	3	90
Laona 1 500—Forest	Gen	Indiv	15	5	43	8	303
Ortiz Hospital	Gen	Indiv	15	5	43	8	303
Madison 37 599—Dane	TB	County	140			138	119
Lake View Sanatorium	TB	County	140			138	119
Madison General Hospital	Gen	NP Assn	100	20	480	116	4 869
Methodist Hospital	Gen	Church	110	10	100	57	2 277
Morningside Sanatorium	TB	NP Assn	50			45	43
Normandale	N & M	Corp	20			13	168
St Mary's Hospital	Gen	Church	170	30	817	126	5 016
State of Wisconsin General Hospital	Gen	State	60	22	204	643	11 600
Wisconsin Orthopedic Hospital	Gen	Unit of State of Wisconsin General Hospital					
Wisconsin Psychiatric Institute	Gen	Unit of State of Wisconsin General Hospital					
Manitowoc 22 963—Manitowoc	Gen	Church	120	20	303	72	2 103
Holy Family Hospital	Gen	Church	120	20	303	72	2 103
Marinette 13 734—Marinette	Gen	NP Assn	40	10	246	20	1 300
Marinette and Menominee Hospital	Gen	NP Assn	40	10	246	20	1 300
Marshfield 6 775—Wood	Gen	Church	162	18	331	104	3 000
St Joseph's Hospital	Gen	Church	162	18	331	104	3 000
Mauston 2 107—Juneau	Gen	Corp	36	6	80	22	700
Mauston Hospital	Gen	Corp	36	6	80	22	700

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Medford, 1918—Taylor							
Medford Clinic	Gen	Corp	30	6	71	19	806
Mendota, 400—Dane							
Mendota State Hospital	Ment	State	890			800	1,200
Veterans Admin Facility	Ment	Ret Vet	750				
Menomonie 5593—Dunn			206			Estab	1800
Menomonie City Hospital	Gen	City	20	7	70	18	633
Merrill 8408—Lincoln	Gen	Church	50	11	191	20	1,109
Holy Cross Hospital	Gen	County	34	4	32	20	201
Lincoln County Hospital							
Milwaukee 578 249—Milwaukee	Gen	NP Assn	120	20	300	80	3,300
Columbia Hospital**							
Evangelical Deaconess Hos- pital*	Gen	Church	130	20	770	90	4,000
Johnston Emergency Hosp	Emerg	City	20	4	3	10	300
Milwaukee Children's Hos- pital*	Chil	NP Assn	200			100	3,461
Milwaukee County General Hospital Dispensary Emer- gency Unit							
Milwaukee Hospital 'The Passavant'	Gen	Church	223	40	880	180	7,100
Misericordia Hospital*	Gen	Church	110	40	793	90	4,044
Mt. Sinai Hospital*	Gen	NP Assn	142	23	814	144	6,419
Sacred Heart Sanitarium*	Gen	Church	300			181	7,060
St Anthony Hospital	Gen	Church	40	12	383	33	1,568
St Joseph's Hospital**	Gen	Church	320	70	1,170	190	7,233
St Luke's Hospital*	Gen	Church	100	20	667	67	3,300
St Mary's Hill	N & M	Church	110			73	400
St Mary's Hospital**	Gen	Church	187	30	592	119	4,880
Shorewood Hospital Sanit	N & M	Corp	50			34	319
South View Hospital	Iso	City	200			112	1,500
Stark Hospital							
Veterans Admin Facility	Unit of Milwaukee Children's Hospital	G & TB Vet	1,178			800	4,000
West Side Hospital	Gen	NP Assn	24	5	30	6	283
Monroe 5015—Green							
Evangelical Deaconess Hos- pital	Gen	Church	40	12	277	30	1,100
Mt Horeb 1420—Dane							
Buckner Hospital	Gen	Indiv	14	6	32	0	300
Neenah 9101—Winnebago							
Theda Clark Memorial Hos- pital*	Gen	NP Assn	50	17	317	36	1,000
New London 4661—Waupaca							
Community Hospital	Gen	Church	50	8	127	24	060
Memorial Hospital	Gen	Indiv	13	6	19	5	124
Oconomowoc 4190—Waukesha							
Rogers Memorial Sanit	N & M	NP Assn	60			47	114
Summit Hospital	Gen	Corp	30	8	52	25	490
Oconto Falls 1921—Oconto							
Oconto Falls Hospital	Gen	NP Assn	11	3	43	7	000
Onalaska 1405—La Crosse							
Oak Forest Sanatorium	TB	County	60			60	50
Osceola 607—Polk							
Ladd Memorial Hospital	Gen	Indiv	8	2	23	3	143
Oshkosh 40103—Winnebago							
Mercy Hospital*	Gen	Church	130	20	389	81	2,144
Park Falls 3036—Price							
Park Falls Hospital	Gen	Indiv	20	4	40	14	600
Pewaukee 1067—Waukesha							
Oak Sanatorium	TB	County	42			40	60
Platteville 4047—Grant							
Andrew Hospital	Gen	Indiv	20	4	18	6	000
Wilson Cunningham Hosp	Gen	Corp	20	5	20	8	210
Plymouth 3882—Sheboygan							
Plymouth Hospital	Gen	Church	20	8	110	16	517
Rocky Knoll Sanatorium	TB	County	90			92	51
Portage 6308—Columbia							
St Saviour's General Hosp	Gen	Church	63	13	100	29	1,100
Prairie du Chien 3943—Crawford							
Beaumont Hospital	Gen	Indiv	20	6	37	7	260
Prairie du Chien Sanitarium Hospital	Gen	Corp	60	8	73	00	1,000
Prescott 705—Pierce							
St Croixdale Sanatorium	Gen	N & M Indiv	50	4	10	41	140
Pureair (Bayfield P O)—Bayfield							
Pureair Sanatorium	TB	County	70			69	74
Racine 67542—Racine							
St Luke's Hospital*	Gen	Church	120	20	463	0	1,000
St Mary's Hospital*	Gen	Church	100	20	629	83	4,000
Sunny Rest Sanatorium	TB	County	08			53	50
Reedsburg 2967—Sauk							
Reedsburg Municipal Hosp	Gen	City	31	8	00	14	600
Rhineland 8019—Onondaga							
St Mary's Hospital	Gen	Church	70	10	104	21	1,100
Rice Lake 3177—Barron							
Lakeview Methodist Hospital	Gen	Church	50	1	101	0	1,000
St Joseph's Hospital	Gen	Church	40	6	61	24	000
Richland Center 362—Richland							
Richland Hospital	Gen	NP Assn	20	7	100	81	1,000
Ripon 3984—Fond du Lac							
Ripon Municipal Hospital	Gen	City	18	7	00	12	600
St Croix Falls 902—Polk							
St Croix Falls Hospital	Gen	Indiv	20	5	00	10	400
Shawano 4183—Shawano							
Shawano Municipal Hosp	Gen	CrCo	170	20	100	32	1,100
Sheboygan 3921—Sheboygan							
St Nicholas Hospital	Gen	Church	40	8	42	60	200
Sheboygan Memorial Hospital	Gen	NP Assn	50	20	200	9	1,000

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Shullsburg 1041—Lafayette Dr Ennis Hospital	Gen	Indiv	8	3	1	10	26
South Milwaukee 10706—Milwaukee South Milwaukee Hospital	Gen	Indiv	13	6	58	6	313
Sparta 4949—Monroe St Mary's Hospital	Gen	Church	50	11	218	52	1612
Stanley 1988—Chippewa Victory Hospital	Gen	NPA's'n	16	7	60	2	571
Statesan 121—Waukesha Wisconsin State Sanit +	TB	State	238			187	110
Stevens Point 13623—Portage River Pines Sanatorium	TB	NPA's'n	60			38	3
St Michaels Hospital	Gen	Church	70	15	196	31	1738
Stoughton 4497—Dane Stoughton Community Hospital	Gen	NPA's'n	22	9	120	14	572
Sturgeon Bay 4983—Door Egeland Hospital	Gen	Indiv	20	5	71	13	503
Leasum Hospital	Gen	Indiv	10		No data supplied		
Superior 36113—Douglas Good Samaritan Hospital	Gen	Church	12	8	133	9	221
St Francis Hospital	Gen	Church	30	10	164	32	867
St Mary's Hospital*	Gen	Church	115	15	230	76	2030
Tomah 3304—Monroe Tomah Indian Hospital	Gen	IA	42	5	38	32	493
Tomahawk 2919—Lincoln Sacred Heart Hospital	Gen	Church	54	6	42	20	607
Two Rivers 10083—Manitowoc Two Rivers Municipal Hosp	Gen	City	37	10	149	26	1022
Washburn 2233—Bayfield Washburn Hospital	Gen	NPA's'n	14	5	20	7	246
Watertown 10613—Jefferson St Mary's Hospital	Gen	Church	75	17	199	40	1106
Waukesha 17716—Waukesha The Spa	IntMed	Corp	68			30	920
Waukesha Municipal Hosp	Gen	City	80	24	386	31	2046
Waukeha Springs Sanit	N&M	Corp	30				
Waupun 0068—Fond du Lac Central State Hospital for Insane	Ment	State	329			315	68
		Rated capacity	204				
Wausau 23708—Marathon Mount View Sanatorium	TB	County	66			64	98
St Mary's Hospital	Gen	Church	130	20	333	72	2462
Wausau Memorial Hospital	Gen	NPA's'n	95	20	309	39	2166
Wauwatosa 21194—Milwaukee Blue Mound Preventorium	Unit of Muirdale Sanatorium						
Milwaukee Asylum for Chronic Insane	Ment	County	1070			1017	103
Milwaukee County General Hospital**	Gen	County	1000	70	918	320	16832
Milwaukee County Hospital for Mental Diseases*	Ment	County	1032			1034	474
Milwaukee Sanatorium*	N&M	Corp	130			121	219
Muirdale Sanatorium	TB	County	500			440	690
West Bend 4760—Wauington St Joseph's Hospital	Gen	Church	20	8	80	16	604
West De Pere 4300—Brown Hickory Grove Sanatorium	TB	County	106			87	90
Whitehall 915—Trempealeau Whitehall Community Hosp	Gen	NPA's'n	30	4	67	18	749
Whitelaw 260—Manitowoc Maple Crest Sanatorium	TB	County	30			47	67
Winnebago 100—Winnebago Sunny View Sanatorium	TB	County	96			90	103
Winnebago State Hospital	Ment	State	904			788	881
		Rated capacity	740				
Wisconsin Rapids 8796—Wood River View Hospital	Gen	NPA's'n	40	15	247	29	1069
Related Institutions							
Adams 1931—Adams Adams Friendship Hosp	Gen	Corp	10	2	10	7	130
Appleton 20267—Outagamie Outagamie County Asylum for Chronic Insane	Ment	County	190			180	21
Barron 1863—Barron Barron City Hospital	Gen	Part	15	8	13	8	999
Chippewa Falls 9539—Chippewa Chippewa County Chronic Insane Asylum	Ment	County	291			269	53
Northern Wisconsin Colony and Training School	MeDe	State	1010	4	11	1060	213
		Rated capacity	1904				
Dodgeville 1907—Iowa Iowa County Insane Asylum	Ment	County	100			143	27
Eau Claire 2698—Eau Claire Eau Claire County Insane Asylum	Ment	County	233			224	27
Elkhorn 2340—Walworth Walworth County Asylum for the Insane	Ment	County	228			106	19
Fond du Lac 26449—Fond du Lac Fond du Lac County Insane Asylum	Ment	County	202			208	20
Green Bay 37415—Brown Brown County Insane Asylum	Ment	County	260			No data supplied	
Wisconsin State Reformatory Hospital	Int	State	26			5	84

## WISCONSIN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Itasca 310—Douglas Douglas County Asylum Home and Sanatorium	Ment	County	200			No data supplied	
Janesville 21628—Rock Rock County Hospital	Ment	County	330			308	81
Jefferson 2639—Jefferson Jefferson County Asylum for Chronic Insane	Ment	County	198			191	20
Juneau 1154—Dodge Dodge County Insane Asylum and Poor House	Ment	County	200			197	26
Kewaunee 2409—Kewaunee Dana and Dockry Hosp	Gen	Part	10	2	9	1	2
Lake Tomahawk 60—Oneida Lake Tomahawk State Camp	TB	State	42			36	54
Lancaster 2432—Grant Grant County Asylum	Ment	County	200			230	10
Madison 57899—Dane East Washington Avenue Hospital	Int	City	60			1	11
Manitowoc 22063—Manitowoc Manitowoc County Insane Asylum	Ment	County	222			199	27
Marshfield 8778—Wood Wood County Asylum for Chronic Insane	Ment	County	220			214	22
Menomonie 5590—Dunn Dunn County Asylum	Ment	County	172			160	14
Milwaukee 678249—Milwaukee Layton Home	Int	Church	33			30	9
Monroe 5010—Green Green County Asylum	Ment	County	220			190	29
Neillsville 2118—Clark Neillsville Hospital	Gen	Indiv	14	4		Reopened	
New Richmond 2112—St Croix St Croix County Asylum for Chronic Insane	Ment	County	174			105	25
Oconto 5030—Oconto Oconto County and City Hospital	Gen	NPA's'n	35	6	3	22	920
Oshkosh 40108—Winnebago Alevian Brothers Hospital	N&M	Church	80			70	138
Owen 1102—Clark Clark County Hospital	Ment	County	330			314	47
Peshigo 1579—Marquette Marquette County Insane Asylum	Ment	County	227			210	45
Racine 67542—Racine Lincoln Mem Hospital for Communicable Diseases	TbInt	City	48	3		24	30
Racine County Asylum	Ment	County	303			209	0
Racine County Hospital	Gen	County	46			40	83
Reedsburg 2967—Sauk Sauk County Asylum	Ment	County	333			108	20
Richland Center 3632—Richland Richland County Asylum for Insane	Ment	County	102			134	14
Shawano 4188—Shawano Shawano County Insane Asylum	Ment	County	194			182	20
Sheboygan 39201—Sheboygan Sheboygan County Asylum for Chronic Insane	Ment	County	215			214	19
Sparta 4949—Monroe Monroe County Insane Asylum	Ment	County	140				
Union Grove 700—Racine Southern Wisconsin Colony and Training School	MeDe	State	700			706	97
		Rated capacity	408				
Verona 400—Dane Dane County Asylum for Chronic Insane	Ment	County	294			282	33
Viroqua 2702—Vernon Vernon County Asylum	Ment	County	130			124	15
Viroqua Hospital	Gen	Indiv	19	8	81	10	769
Watertown 10613—Jefferson Bethesda Lutheran Home for Feeble-minded and Epileptics	MeDe	Church	360				
Waukesha 17176—Waukesha Waukesha County Asylum for Chronic Insane	Ment	County	200			214	75
Wisconsin Industrial School for Boys	Int	State	18			6	100
Wauwata 3131—Wauwata Wauwata Hosp and Clinic	Gen	Part	14	2	14	5	267
Waupun 5768—Fond du Lac Clarke and Swartz Hosp	Gen	Part	8	4	48	0	160
Wisconsin State Prison Hospital	Int	State	21			17	218
Wausau 23708—Marathon Marathon County Asylum for Chronic Insane	Ment	County	189			189	22
Marathon County Home and Hospital	Int	County	65			55	103
Wauwatosa 21194—Milwaukee Milwaukee County Home for Dependent Children	Int	County	60			64	1087
St Camillus Hospital	Int	Church	65			06	144
Salvation Army Martha Washington Women's Home and Hospital	Mat	Church	30	35	123	67	146

Key to symbols and abbreviations is on page 986

## WISCONSIN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
West Bend 4760—Washington Washington County Asylum for Chronic Insane	Ment	County	154			149	16
West Salem 1,011—La Crosse La Crosse County Asylum for Insane	Ment	County	275			250	18
Weyauwega 1,067—Waupaca Waupaca County Insane Asylum	Ment	County	190			183	18
Whitehall 915—Trempealeau Trempealeau County Asylum for Chronic Insane	Ment	County	145			133	12
Winnebago 1,120—Winnebago Winnebago County Asylum	Ment	County	262			248	32
Wyocena 490—Columbia Columbia County Asylum	Ment	County	320			179	13
Summary for Wisconsin							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	159	19,180	14,510	242,824			
Totals	218	30,498	24,992	290,019			
Refused registration	13	787					

## WYOMING

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Basin 903—Big Horn Wyoming Tuberculosis Sanatorium	TB	State	33			23	60
Burns 216—Laramie Burns Private Hospital	Gen	Indiv	10	5	8	4	100
Casper 16,619—Natrona Memorial Hospital of Natrona County	Gen	County	50	15	248	53	2,007
Cheyenne 17,861—Laramie Memorial Hospital of Laramie County	Gen	County	133	15	236	63	2,158
Veterans Admin Facility Douglas 1,917—Converse Douglas Hospital	Gen	Vet	108			101	838
Evanston 3,072—Uinta Wyoming State Hospital	Gen	Indiv	19	4	30	8	334
Ft Warren 22—Laramie Station Hospital	Ment	State	500			549	121
Ft Washakie 62—Fremont Shoshone Indian Hospital	Gen	Rated capacity	630				
Gillette 1,340—Campbell McHenry Hospital	Gen	Army	250	5	57	196	5,031
Jackson 533—Teton St John's Hospital	Gen	IA	40	6	60	29	728
Kemmerer 1,884—Lincoln Lincoln County Miner's Hospital	Gen	Indiv	17	6	32	7	364
Lander 1,826—Fremont Bishop Randall Hospital	Gen	Church	20	4	27	8	469
Lovell 1,857—Big Horn Lovell Hospital	Gen	NP Assn	20	5	43	9	453
Powell 1,156—Park Whitlock Hospital	Gen	Church	20	6	50	14	566
Rock Springs 8,440—Sweetwater Wyoming General Hospital	Gen	Indiv	20	6	99	10	358
Sheridan 8,536—Sheridan Sheridan County Memorial Hospital	Gen	Corp	20	5	30	7	320
Veterans Admin Facility Wheatland 1,997—Platte Wheatland General Hospital	Gen	State	100	14	346	60	3,693
Related Institutions	Gen	County	70	12	221	51	1,700
Basin 903—Big Horn Basin Hospital	Gen	Vet	598			588	323
Gebo 894—Hot Springs Gebo Hospital	Gen	NP Assn	41	7	72	23	930
Greybull 1,806—Big Horn St Luke's Hospital	Gen	County	11	2	14	3	130
Hanna 1,500—Carbon Hanna Hospital	Gen	Indiv	8	2	36	4	143
Lander 1,826—Fremont Wyoming State Training School	Gen	Indiv	8	2	20	3	163
Thermopolis 2,123—Hot Springs General Hospital	Gen	NP Assn	11	3	33	8	268
Yellowstone Park 200—Yellowstone Mammoth Hospital	Gen	NP Assn	364			255	29
Summary for Wyoming	Number	Beds	Average Census	Admissions			
Hospitals and sanatoriums	19	2,244	1,805	20,553			
Related institutions	7	437	354	1,258			
Totals	26	2,681	2,159	21,811			
Refused registration	4	111					

## ALASKA

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Anchorage 2,277 Alaska Railroad Base Hosp	Gen	Fed	30	5	39	18	1,352
Cordova 980 Cordova General Hospital	Gen	Indiv	12	3	12	7	212
Fairbanks 2,101 St Joseph's Hospital	Gen	Church	40	6			
Ft Yukon 304 Hudson Stuck Mem Hosp	Gen	Church	40	2			
Hailey 344 Station Hospital	Gen	Army	10	1	7	4	100
Juneau 4,043 St Ann's Hospital	Gen	Church	64	9	104	15	977
U S Hospital for Natives	Gen	G&TB IA	58	7	50	47	363
Kanakana 177 Kanakana Native Hosp	Gen	IA	14	2	10	16	401
Kenecott 217 Kenecott Copper Corpora	Indus	Corp	16	2			3
Kenecott 3,796 Kenecott General Hosp	Gen	Church	40	8			
Kotzebue 291 Kotzebue Hospital	Gen	IA	16	2			
Mountain Village, 76 U S Hospital for Natives	Gen	IA	20	2			
Nome 1,213 Maynard Columbus Hosp	Gen	Church	20	2	20	8	90
Petersburg 1202 Petersburg General Hosp	Gen	City	9	3	23	6	214
Point Barrow (Barrow P O) 82 Presbyterian Hospital of Point Barrow	Gen	Church	12	3			
Seward 830 Seward General Hospital	Gen	Church	21	3	27	13	343
Sitka 1,006 Pioneer's Home Hospital	Inst	Ter	50		1	38	150
Tanana 185 Tanana Hospital	Gen	IA	20	3	12	20	141
Wrangell 948 Bishop Rowe General Hosp	Gen	Church	14	2	12	3	141

## CANAL ZONE

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ancon 1,140 Gorgas Hospital*	Gen	Fed	506	36	570	468	12,801
Balboa 2,902 Palo Seco Lepro Colony	Lepro	Fed	110			104	8
Station Hospital	Gen	Army	35			26	1,213
Corozal 1,700 Corozal Hospital	Ment	Fed	340			283	163
Station Hospital	Gen	Army	50			30	1,583
Cristobal 559 Colon Hospital	Gen	Fed	114	15	350	90	4,181
Ft Davis 293 Station Hospital	Gen	Army	50			39	2,215
Ft Randolph (Coco Solo P O) 724 Station Hospital	Gen	Army	11			10	1,213
Ft Sherman 783 Station Hospital	Gen	Army	47			20	1,400
France Field 764 Station Hospital	Gen	Army	14				

## GUAM

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Agaña Susana Hospital for Natives	Unit of U S Naval Hospital	Gen	90	25			

## HAWAII

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aiea 3,021—Honolulu Honolulu Plantation Ho p	Gen	NP Assn	42	4	31	15	555
Eleele 312—Kauai McBryde Sugar Company Hospital	Gen	NP Assn	20	5	42	26	843
Halea—Hawaii Honolulu Sugar Company Ho pital	Gen	NP Assn	23	4	23	10	255
Hakalau 525—Hawaii Hakalau Plantation Ho p	Gen	NP Assn	20	3	15	8	313
Hilo 19,438—Hawaii Hilo Memorial Hospital	Gen	County	137	18	227	101	2,490
Puuwale Home for Tuberculosis	TB	County	140			15	17
Honolulu 137,552—Honolulu Japanese Ho pital	Gen	NP Assn	190	5	60	77	2,461
Kalihi Receiving Station	Lepro	Ter	200				

Key to symbols and abbreviations is on page 986

## HAWAII—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Kapiolani Maternity and Gynecological Hospital	GynMat	NPAAssn	50	36	808	30	1 540
Kauikoolani Children's Hospital	Chil	NPAAssn	75			60	2 927
Leahua Home	TB	NPAAssn	440			403	317
Queen's Hospital	Gen	NPAAssn	300	20	690	190	8 097
St. Francis Hospital	Gen	Church	60	10	164	51	2 266
Shriners Hospital for Crippled Children	Orth	Frat	28			26	73
Tripler General Hospital	Gen	Army	300	7	97	193	3 067
Hooilehua—Mau							
Robert W. Shingle Jr. Memorial Hospital	Gen	Church	17	6	70	14	501
Kahuku 150—Honolulu							
Kahuku Plantation Company's Hospital	Gen	NPAAssn	29	6	97	19	631
Kalaupapa—Kalaupapa							
Leprosy Hospital	Lepro	Ter	52		6	41	201
Kaneohe (Heeia P. O.) 112—Honolulu							
Territorial Hospital	Ment	Ter	867		2	822	294
Kealahou 300—Hawaii							
Kona County Hospital	Gen	County	28	3	30	15	274
Kealia 100—Kauai							
Kealia Hospital	Gen	NPAAssn	24	4	42	13	306
Samuel Mahelona Memorial Hospital	TB	County	100				75
Kilauea 1932—Kauai							
Kilauea Hospital	Gen	Corp	20	4			
Kohala 1844—Hawaii							
Kohala County Hospital	Gen	County	38	6	89	21	884
Kolaa Sugar Company's Hospital	Gen	NPAAssn	22	3	31	12	443
Kula (Waiaho P. O.) 20—Mau							
Kula Sanatorium	G&TB	TerCo	210	4	54	149	661
Lahaina 2,730—Mau							
Pioneer Mill Company's Hospital	Gen	NPAAssn	57	9	132	46	2 074
Lanai City—Mau							
Lanai Hospital	Gen	NPAAssn	25	4	63	13	683
Lihue 2390—Kauai							
Lihue Hospital	Gen	Corp	55	6	44	32	988
Makaweli 974—Kauai							
Hawaiian Sugar Company's Hospital	Gen	NPAAssn	44	4	70	30	906
Olaa 69—Hawaii							
Olaa Hospital	Gen	NPAAssn	43	10	115	36	913
Ookala 526—Hawaii							
Hospital of Kaliki Sugar Company	Gen	NPAAssn	10	5	29	5	201
Paaahu 536—Hawaii							
Paaahu Plantation Company Ltd Hospital	Gen	NPAAssn	15	2			
Paaahu 1933—Hawaii							
Paaahu Hospital	Gen	NPAAssn	14	3	16	5	
Pahala 290—Hawaii							
Hawaiian Agricultural Company Hospital	Gen	Corp	38	6	98	21	811
Pala 4171—Mau							
Mau Agricultural Company's Pala Hospital	Gen	Corp	103	10			
Pearl City 1071—Honolulu							
Waimano Home for Feeble-minded Persons	MeDe	Ter	368		4	379	55
Pearl Harbor 200—Honolulu							
U. S. Naval Hospital	Gen	Navy	178			142	2 222
Pepeekeo 520—Hawaii							
Pepeekeo Central Hospital	Gen	NPAAssn	30	5	118	20	840
Puunene 4 080—Mau							
Puunene Hospital	Gen	NPAAssn	100	24	293	67	2 793
Schofield Barracks (Honolulu P. O.) 4 200—Honolulu							
Station Hospital	Gen	Army	300	12	61	208	4 153
Wailua 4 511—Honolulu							
Wailua Agricultural Company Ltd Hospital	Gen	NPAAssn	38	10	127	29	946
Wailuku 6 998—Mau							
Malulani Hospital	Gen	County	88	10	181	70	2 501
Waimanalo 1 000—Honolulu							
Waimanalo Hospital	Gen	NPAAssn	16				
Waima 2 091—Kauai							
Waima Hospital	Gen	NPAAssn	30	6	88	33	905
Walpahu 5 844—Honolulu							
Oahu Sugar Company Ltd Hospital	Gen	NPAAssn	62	8	147	50	1 213

## PHILIPPINE ISLANDS

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Dacodel 19 300—Occidental Negros							
Occidental Negros Provincial Hospital	Gen	Gov t	77	4			
Children's Maternity and Hospital	MatCh	Gov t	62	18	400	42	2 464
Baguio 5 464—Benguet							
Baguio Hospital	Gen	Gov t	80	8	100	88	2 837
Station Hospital	Gen	Army	50			11	2 47
Barill 33 481—Cebu							
Hospicio de San Jose	Inc	Gov t	20				
Batangas 41 182—Batangas							
Batangas Provincial Hospital	Gen	Gov t	30	3	16	20	1 007
Bayombong 5 000—Nueva Vizcaya							
Bayombong Hospital	Gen	Gov t	27	1	8	14	531

## PHILIPPINE ISLANDS—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Binalbagan 8 892—Occidental Negros							
Rizal Memorial Hospital	Gen	Corp	15	2			
Bontoc 609—Mountain							
Bontoc Hospital	Gen	Gov t	30	3			
Butuan 9 790—Agusan							
Butuan Public Hospital	Gen	Gov t	32		17	26	1 168
Cabanatuan 10 202—Nueva Ecija							
Nueva Ecija Provincial Hospital	Gen	Gov t	90	10			
Cagayan 28 164—Misamis Oriental							
Cagayan Mission Hospital	Gen	Church	50	10			
Misamis Oriental Provincial Hospital	Gen	Gov t	25	5	24	21	923
Calamba 18 062—Laguna							
Calamba Sugar Estate Hospital	Gen	Corp	39		56	30	1 336
Calvo 13 890—Capiz							
Capiz Provincial Hospital	Gen	CityGov t	30	4	15	25	740
Capiz 21 996—Capiz							
Emmanuel Hospital	Gen	Church	70	5			
Cavite 22,163—Cavite							
U. S. Naval Hospital	Gen	Navy	185			102	1 251
Cebu 60 300—Cebu							
Cebu General Clinic	Gen	Part	24	4	15	17	649
Cebu Maternity House	Mat	NPAAssn	00	30			
Chong Hoa Chinese Hospital	Gen	NPAAssn	20				
St. Joseph's Hospital	Gen	Corp	24	6	12		592
Southern Islands Hospital	Gen	Gov t	110	4	123	101	3 049
Cervantes 2 513—Ilocos Sur							
Cervantes Hospital	Gen	Gov t	30	2	20		1 006
Corregidor—Cavite							
Station Hospital	Gen	Army	150	4	79	75	2 024
Cotabato 410—Cotabato							
Cotabato Public Hospital	Gen	Gov t	40	2			
Cullion—Palawan							
Cullion Leper Colony Hospital	GenLepro	Gov t	618	16	155		2 814
Emergency Hospital No. 1	Unit of						
Cuyo 14 760—Palawan							
Cuyo Public Hospital	Gen	Gov t	20	3			
Dagupan 22 612—Pangasinan							
Pangasinan Provincial Hospital	Gen	Gov t	50				
Dansalan 5 988—Lanao							
Lanao Public Hospital	Gen	Gov t	50				
Dapitan 12 560—Zamboanga							
Rizal Memorial Hospital	Gen	Gov t	50				
Davao 13 046—Davao							
Davao Mission Hospital	Gen	Church	40	1			
Davao Public Hospital	Gen	Gov t	60	5			
Mintal Hospital	Gen	Corp	75	10	30	45	
Del Carmen—Pampanga							
Del Carmen Hospital	Gen	NPAAssn	32	3			
Dipolog 15 932—Zamboanga							
Dipolog Emergency Hospital	Gen	Gov t	12				
Dumaguete 16 227—Oriental Negros							
Dumaguete Mission Hospital	Gen	Church	62	1	42	37	1 309
Elmira 164—Occidental Negros							
Ilico Hospital	Gen	Corp	00		62	35	1 387
Ft. Stotsenburg—Pampanga							
Station Hospital	Gen	Army	115	6	286	40	2 108
Ft. William McKinley—Rizal							
Station Hospital	Gen	Army	87			24	1 218
Iloilo 49 114—Iloilo							
Iloilo Maternity and Children's Hospital	MatCh	Indiv	11	4	71	6	231
Iloilo Mission Hospital	Gen	Church	86	12	93	65	1 974
Iloilo Polyclinic and Hospital	Gen	Indiv	24	6	18	12	739
St. Paul's Mission Hospital	Gen	Church	100				
Isabela 2 281—Zamboanga							
Basilan Lumber Hospital	Indus	Corp	24				
Jolo 5 796—Sulu							
Sulu Public Hospital	Gen	Gov t	40	10			
Kabasaran—Zamboanga							
Pathfinder Estate Hospital	Gen	NPAAssn	11				
Kiangan 276—Iligan							
Kiangan Hospital	Gen	Gov t	15	1	7	11	700
Kolambungan 1 260—Lanao							
Kolambungan Hospital	Gen	NPAAssn	30	2	6	12	602
Laoag 38 469—Ilocos Norte							
Sallie Long Read Memorial Hospital	Gen	Church	40	2			
San Antonio Hospital	Gen	Indiv	18	1			
Legaspi 52 756—Albay							
Albay Provincial Hospital	Gen	Gov t	35	2			
Milwaukee Hospital	Gen	Church	29	6			
Los Banos 6 335—Laguna							
University of the Philippines Los Banos Infirmary	Gen	Gov t	20	2	8	2	446
Lubugan 226—Kalinga							
Lubugan Hospital	Gen	Gov t	8				
Luzon 11 939—Tayabas							
Tayabas Provincial Hospital	Gen	Gov t	50	3	63	68	2 287
Makati 12 470—Rizal							
Hosp. Espanol de Santiago	Gen	NPAAssn	54		87	8	1 070
Malaybalay 9 565—Bukidnon							
Bukidnon Public Hospital	Gen	Gov t	17	1			
Malolo 26 444—Bulacan							
Bulacan Provincial Hospital	Gen	Gov t	30	6	74	23	1 115
Vonduluyong—Rizal							
Insular Psychopathic Hospital	Ment	Gov t	800				
Mandaue 21 464—Cebu							
Eversley Childs Treatment Station	Lepro	Gov t	750			878	472

Key to symbols and abbreviations is on page 986



## PHILIPPINE ISLANDS—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Manila, 280 306—Rizal	Gen	Gov t	200	6			
Billbid Hospital	Gen	NPA'sn	100	18			
Chinese Hospital	Gen	Church	239	12			
Hosp de San Juan de Dios	Gen	Church	50	6	33	25	1,126
Manila Sanit and Hospo	Gen	Church	70	12			
Mary Chiles Hospital	Gen	Church	80	30	546	64	1,412
Mary Johnston Hospital	Gen	Church					
Maternity and Childrens Hospital	MatCh	Gov t	77	6	2,045	70	3,292
Philippine General Hosp	Gen	Gov t	663	64	4,647	634	21,079
St Josephs Hospital	Gen	Corp	75	10	159	45	2,159
St Luke's Hospital	Gen	Church	130	10	196	80	3,007
St Pauls Hospital	Gen	Church	100	14	149	55	2,194
St Therestas Hospital	Gen	Indiv	65	10			
Sampaloc Maternity Hosp	Gen	Indiv	20	10			
San Lazaro Hospital	Tblso	Gov t	769				
Sternberg General Hosp	Gen	Army	315	8	101	195	3,169
Margosatubig - Zamboanga							
Margosatubig Emergency Hospital	Gen	Gov t	18				
Mati 6 440—Davao							
Mati Emergency Hospital	Gen	Gov t	6				
Naga 9 396—Camarines Sur							
Naga Hospital	Gen	Gov t	22				
Olongapo—Zambales							
Camilla Simpson Hospital	Gen	NPA'sn	10	7			
Paracale 6 378—Camarines Norte							
General Hospital	Gen	Corp	35	3		Estab	1937
Pasay 18 823—Rizal							
Harrison Hospital	Gen	Indiv	40		52	13	532
Mercy Hospital	Gen	Indiv	20	8	53	6	305
Puerto Princesa 5 127—Palawan							
Puerto Princesa Hospital	Gen	Gov t	16				
Sagada 167—Mountain							
St Theodore's Hospital	Gen	Church	40	6	14	21	1,216
San Carlos 41,820—Occidental Negros							
San Carlos Milling Company Ltd Hospital	Gen	NPA'sn	15	5			
San Fernando 19 885—La Union							
Bethany Hospital	Gen	Church	36	4	33	22	1,125
San Fernando 21 092—Pampanga							
Pampanga Provincial Hosp	Gen	Gov t	50	8			
San Jose—Antique							
Antique Provincial Hosp	Gen	Gov t	16	6	16	12	390
San Juan del Monte, 6 618—Rizal							
Manila Heights Hospital	Gen	Indiv	100				
San Miguel 18 147—Bulacan							
Eladia Memorial Hospital	Gen	City	12		12	4	162
San Pablo, 31 214—Laguna							
San Pablo Hospital	Gen	City	20				
San Roque—Cavite							
San Ramon Hospital	Gen	Indiv	14	10	30		76
Santa Barbara 30 913—Hilo							
Western Visayas Treatment Station	Lepro	Gov t	250				
Santa Cruz 14 151—Laguna							
Laguna Provincial Hosp	Gen	Gov t	55	12	20	31	1,239
Santol—Rizal							
Santol Tuberculosis Sanat	TB	NPA'sn	300			303	823
Silay 23 065—Occidental Negros							
Silay Maternity and Childrens Hospital	Gen	City	21	6			
Sorsogon 17 049—Sorsogon							
Sorsogon Provincial Hosp	Gen	Gov t	14	1	9	10	474
Tacloban, 15 478—Leyte							
Bethany Hospital	Gen	Church	24	2	17	17	905
Leyte Provincial Hospital	Gen	Gov t	40	5			
Tagbilaran 12 590—Bohol							
Bohol Provincial Hospital	Gen	Gov t	43	7	75	27	1,186
Presbyterian Mission Hosp	Gen	Church	44	2	44	21	2,442
Tannuan 19 074—Leyte							
Maternity Hospital	Gen	NPA'sn	15	6			
Tarlac, 23 886—Tarlac							
Tarlac Provincial Hospital	Gen	Gov t	35	6	100	30	1,246
Vigan 17 764—Ilocos Sur							
Ilocos Sur Provincial Hosp	Gen	Gov t	10	1	13	10	572
Philippine Christian Institute Hospital	Gen	Church	20	5			
Zamboanga 50 798—Zamboanga							
Brent Hospital	Gen	Church	40	6	21	30	801
San Ramon Prison Hosp	In t	Gov t	45			4	163
Station Hospital	Gen	Army	10			66	2,423
Zamboanga General Hosp	Gen	Gov t	92	8	172		

## PUERTO RICO—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Central Aguirre—Guayama							
Aguirre Hospital	Gen	Corp	33	2	5	25	718
Fajardo 7 322—Humacao							
Luis Manuel Hospital	Gen	City	32	4			
Guayama 10 953—Guayama							
Hospital de Tuberculosos	TB	Gov t	100			90	219
Gurabo 3 463—Humacao							
Municipal Hospital	Gen	CyCo	14		10	13	256
Humacao 7 937—Humacao							
Clinica Oriente	Gen	Part	34	2	15	12	453
Ryder Memorial Hospital	Gen	Church	50	8	66	46	1,549
Jayuya 6 361—Ponce							
Fegueras Memorial Hosp	Gen	CyCo	20	6	52	14	813
Juana Diaz 2 466—Ponce							
Hospital Municipal	Gen	City	33	5	103	30	1,035
Juncos 5 297—Humacao							
Hospital Municipal	Gen	City	18				
Lares 3 049—Aguadilla							
Clinica San Jose	Gen	Indiv	8	2			
Las Piedras 1 335—Humacao							
Las Piedras Municipal Hosp	Gen	City	16				
Lolza 1 606—Humacao							
Lolza Municipal Hospital	Gen	City	21		18	15	355
Manati 7 449—Arecibo							
Hosp Municipal Manati	Gen	City	50	5			
Maunabo, 1 117—Guayama							
San Carlos Municipal Hosp	Gen	City	15	2	10	19	
Mayaguez 37 060—Mayaguez							
Clinica Betances	Gen	Indiv	70	6	2	22	423
Mayaguez and Western Poly clinic	Gen	Indiv	100	6	26	62	1,800
Mayaguez Sanatorium	Gen	Part	30				
Sanatorio Antituberculosis	TB	Gov t	200				
Naguabo, 4 037—Humacao							
Municipal Hospital	Gen	City	58		55	26	
Ponce 53 490—Ponce							
Antituberculosis Hospital and Center	TB	Gov t	312			295	691
Clinica Quirurgica del Dr Pila	Gen	Indiv	130	8	73		2,163
Hospital de Ninos	Gen	Church	20	3			346
Hospital Municipal Valentina Tricocha	Gen	City	179	6	240	194	4,413
St Luke's Memorial Hosp	Gen	Church	65	12	63	40	1,857
Santo Asilo de Damas Hosp	Gen	Church	110				
Rio Piedras 13 408—San Juan							
Clinica Dr M Julia	N&M	Indiv	125			125	50
Insular Leper Colony	Lepro	Gov t	80			40	160
Insular Tuberculosis Sanat	TB	Gov t	804			780	1,915
Psychiatric Hospital of Puerto Rico	Ment	Gov't	1 000				
Sanatorio de la Sociedad Espanola de Auxilio Mutuo y Beneficencia de Puerto Rico	Gen	Frat	150	25	72	42	1,334
Salinas 2,252—Guayama							
Hospital de Salinas	Gen	City	40	6	89	30	877
San Juan 114 715—San Juan							
Capital City Hospitals	Gen	City	300	60		50	975
Clinica Diaz Garcia	Gen	Corp	75	6	27	50	975
Contagious Disease Hosp	Iso	City	50			21	419
Hospital de la Penitencia	InstGen	Gov t	38	20		34	895
Hospital San Jose	Gen	NPA'sn	80	10	16	24	599
Instituto Medico Quirurgico	Gen	NPA'sn	35	6		15	599
Presbyterian Hospital*	Gen	Church	116	20	466	105	5,000
Puerto Rico Sanatorium	Mat	Indiv	16	16			
Station Hospital	Gen	Army	66	2	12	63	912
University Hospital of the School of Tropical Medicine	Gen	Gov t	60			29	51
Sanctus—San Juan							
Hospital Mimya	Gen	Indiv	100	15	53	60	655
Santa Rosa Clinic	Gen	NPA'sn	15	2			
Utando 4 758—Arecibo							
Clinica San Miguel	Gen	Indiv	70	3	4	50	
Vega Baja 4 754—Arecibo							
Dr J M Armuliz's Hospital	Gen	Indiv	12	2		40	625
Vega Baja Municipal Hosp	Gen	CyCo	25	6	32		
Yabucoa 3 841—Humacao							
Yabucoa City Hospital	Gen	City	24	2			
Yauco 5 807—Mayaguez							
Clinica El Amparo	Gen	Indiv	22		5	1	43
Yauco Hospital	Gen	City	30				

## PUERTO RICO

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Aguadilla 10 952—Aguadilla							
Hospital Municipal	Gen	City	24	4			
Anasco 3 064—Aguadilla							
Municipal Hosp of Anasco	Gen	City	16	3			
Bayamon 12 056—San Juan							
Hospital Municipal de Bayamon	Gen	City	20				
Cabo Rojo 4 605—Mayaguez							
Hospital Municipal	Gen	City	24			15	213
Cayey 5 953—Guayama							
Clinica Dr Villeneuve	Gen	Indiv	10	10			

## VIRGIN ISLANDS

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Christiansted 3 767—St Croix Island							
Christiansted Municipal Hospital	Gen	City	60	8	107	45	1,500
Richmond Hospital	Ment	City	50			43	25
St Croix Hospital for Leprosy	Lepro	City	92		2	80	14
Frederiksted 2 698—St Croix Island							
Frederiksted Municipal Hospital	City	City	45	11	74	24	1,141
St Thomas 7 655—St Thomas Island							
Municipal Hospital	City	City	100	12	66	49	853

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**SATURDAY, MARCH 26, 1938**

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**HOSPITAL SERVICE—1937**

The admirable cooperation of hospital superintendents, medical directors and many others has made possible this annual census of hospitals. Official reports have been received from 97.6 per cent of the hospitals, which represent 99.4 per cent of the total capacity of all registered hospitals. The 954 hospitals approved for internships and residencies made a 100 per cent response to the request for information.

For twenty-nine successive years the hospital facilities of the United States have been enhanced each year by a net increase of between 20,000 and 30,000 beds. This year the increase was 27,827. This does not include rebuilding, replacements, repairs or expansion of scientific or administrative quarters. It is a net permanent addition to the capacity for accommodating additional patients.

The unprecedented number of 9,221,517 patients passed through the portals of the hospitals at a rate of one patient every 3.4 seconds night and day throughout the entire year. Including those already hospitalized January first—approximately 908,516—approximately 10,130,033 patients received hospital care during the year. For all these facilities and all these patients an adequate number of qualified staff physicians, consultants, residents, interns, pathologists, radiologists and other specialists were available besides nurses, dietitians, technicians and other personnel, to render appropriate care to the sick and injured.

In contrast with the past, when only a few institutions were "teaching hospitals," some educational function is now assumed by practically every hospital of any size in the United States. The hospitals approved for the formal training of interns and resident physicians represent nearly 60 per cent of the capacity of the entire hospital field, state mental institutions and all others included. The experience gained by physicians through staff conferences, clinics and demonstrations, postgraduate and "refresher" courses and informal teaching, and the training of nurses, technicians and other personnel makes the amount of education in hospitals tremendous and incalculable.

Still another type of growth gives encouragement the constant expansion of hospital service in new territories, with better personnel, organization and equipment in the smaller outlying hospitals. For example, along with advancing standards, the number of hospitals has increased in such states as Florida, Louisiana, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Texas, Washington and West Virginia, while a reduction is recorded in Illinois, New York, Ohio, Virginia and Wisconsin. Verified reports indicate that 100 institutions of various sizes, well distributed, have recently been opened, registration of which is pending. In addition to these, the Council has knowledge of at least seventy hospitals that are under construction and an additional 179 that have been planned and partly or entirely financed.

In preparing the list of registered hospitals for the American Medical Directory and the Hospital Number of THE JOURNAL, care has been exercised to give endorsement only to institutions that are worthy of confidence, in order that the public, the profession and the hospitals may be protected.

Further cooperation and mutual understanding between all groups working in the hospital field will be necessary for the maintenance of the high quality of service that is desired for all time for the sick and injured.

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**EDUCATIONAL ACTIVITIES IN HOSPITALS**

The report of the Council on Medical Education and Hospitals published in this issue of THE JOURNAL again reveals the vast hospital facilities available in the United States for the care of the sick and injured. Their magnitude is revealed in the impressive totals of 6,128 registered hospitals treating on an average 944,436 patients daily and more than ten million patients a year exclusive of those aided in the outpatient clinics.

To the medical profession the term "welfare of patients" has a meaning that goes far beyond the immediate care of the sick. It encompasses the aims of preventive medicine and public health, the problems of social and mental hygiene, health education, clinical and laboratory research, innovations in therapy and, above all, the preservation and continuity of medical practice through the education of young physicians.

Hospital practice and medical education go hand in hand. Each depends on the other and the two derive mutual benefits from intimate association. This relationship has long been recognized, for as early as 1904 the fifth year of medicine, or the hospital internship, became incorporated in the standards of the Council. In 1914 the first list of hospitals approved for intern training was published and in 1927 a provision was made for the separate classification of residencies in specialties. Originally there were 508 general hospitals on the approved list offering 2,667 internships, and ninety-five special hospitals accepting

428 Subsequent developments have extended the teaching service to 732 internship hospitals and 465 in the residency classification. These can accommodate 7,223 interns and 3,328 resident physicians.

The approval of hospitals for internships and residencies is a recognition of educational achievement and a means to acquaint prospective interns and residents with the available opportunities for advanced training. Regular visits of inspection are made to all approved hospitals by members of the Council's staff to insure that the published lists of the Association represent educational services complying fully with the requirements of the Council.

As a result of the certifying activities of the Specialty Boards established in twelve divisions of medicine and surgery, there is a beginning realignment of graduate medical education with a clearer definition of its component parts. The internship continues as an essential preparation for general practice but already the emphasis is shifting from highly technical procedures to fundamental training in diagnosis and therapy. There is increased instruction in general medicine, obstetrics, pediatrics, minor surgery, the care of wounds and the treatment of accidents and emergencies and less effort to teach major surgical technique. Interns are primarily concerned with the diagnostic aspect of the surgical service, preoperative and postoperative care, surgical pathology and the study of end results. Technical training in major surgery is falling more and more within the province of resident physicians preparing themselves for a surgical career.

The residencies which represent postgraduate training in the preparation for special practice are rapidly increasing their scope to include the instruction in basic sciences required by the Specialty Boards. They are characterized too by a greater assumption of responsibility on the part of the residents and better opportunities for technical training. In university hospitals and others having affiliation with medical schools the residencies often assume the plan of fellowships which involve research and studies leading to advanced degrees.

Certain aspects of the intern service are constantly changing and necessitate corresponding revisions in the Essentials on which approval is based. Similarly, recent developments in the specialties make new demands for fuller information concerning residencies. With the cooperation of the certifying boards it is hoped that specific standards can be developed for the educational service of the individual specialties.

Currently the salary question looms large in the minds of interns in certain sections of the country. In general, however, there is every indication that the selection of an internship is still on the basis of educational returns and not in anticipation of financial remuneration. The fact that the vast majority of interns—84.4 per cent—receive no salary or less than \$25 a month is further proof of the educational sig-

nificance of the internship. The practice of offering an allowance for incidental expenses is not objectionable. On the other hand the educational ideal of the internship, which should be paramount, will be difficult to preserve if salaries are increased to such an extent that hospitals begin to believe that they have fully discharged their obligations to interns on a cash basis.

#### SERUM-POTENTIATED TUBERCULOSIS VACCINE

The history of vaccine therapy in tuberculosis has been characterized by repeated claims of success in laboratory animals followed by demonstrated clinical failure. Nevertheless the search goes on, the most recent being heat-killed suspension of tubercle bacilli energized with horse serum. According to Opie and Freund,<sup>1</sup> this energized vaccine is as effective as the Calmette-Guérin viable vaccine (BCG) when used as a prophylactic agent in tuberculosis.

About four years ago a new direction was given to vaccine research by the discovery of the "Burky phenomenon,"<sup>2</sup> the possibility of rendering certain relatively nonantigenic substances highly antigenic by combining them with "synergins" or "potentiators." Burky found that staphylococcus toxin, for example, will energize pollen proteins or homologous lens proteins in such a way as to render them highly antigenic for rabbits. This observation has been confirmed by Swift and Schultz<sup>3</sup> of the Rockefeller Institute, who have found that substances other than staphylococcus toxin, such as normal horse serum, also function as antigenic synergins.

Following this lead, Opie and Freund of the Department of Pathology, Cornell University Medical College, studied the possibility of energizing heat-killed tubercle bacilli by combining them with synergic agents. Among the possible energizers tested by the New York pathologists are alum, staphylococcus filtrate, typhoid vaccine, heat-inactivated horse serum and heated sheep serum. All tests were made on rabbits and the resulting antituberculous immunity titrated by intravenous injection with a strain of bovine tubercle bacilli that produces predominantly pulmonary lesions in rabbits. Estimations of the immunity were based on the average length of life of the vaccinated and control groups of rabbits and on the degree of pulmonary involvement either at the time of death or at the termination of a specified period (usually two years).

The Cornell investigators found that heat-killed tubercle bacilli reinforced with certain synergins, "notably heated horse serum," give rise to an immunity approximately the same as that afforded by the viable attenuated Calmette-Guérin vaccine. Acquired immunity in tuberculosis is relative, being overcome by

<sup>1</sup> Opie E. I. and Freund Jules. *J. Exper. Med.* 66: 761 (Dec) 1937.

<sup>2</sup> Burky E. I. *J. Allergy* 5: 466 (July) 1934.

<sup>3</sup> Swift H. F. and Schultz M. P. *J. Exper. Med.* 63: 703 (May) 1936.

increasing the number of micro-organisms in the test dose. It is also temporary, tending to diminish or disappear after from one to two years. Within these recognized limits it seemed probable from these animal experiments that immunization of susceptible persons by means of the Opie-Freund synergized heat-killed vaccine might be clinically effective. A number of persons repeatedly exposed to tuberculosis were therefore vaccinated with the heat-killed tubercle bacilli plus inactivated horse serum. The results were sufficiently encouraging to warrant a continuation of the trials.

The possibility of replacing antigenic horse serum with less objectionable nonantigenic potentiating agents is under investigation in numerous laboratories. Madison<sup>4</sup> of Stanford University School of Medicine, for example, has found that crystalline vitamin C will potentiate certain vaccines. The search goes on, such investigations may eventually lead to a method whereby our already low rates for tuberculosis may be reduced still further.

### Current Comment

#### REAL AND IDEAL MEDICAL GROUPS

"Medical groups" is a favorite phrase with which current medical propagandists would conjure. "Medical cooperators," sickness insurance advocates and many others propose to provide all service through "medical groups." Organized medical groups have a place in the delivery of medical service and have made significant contributions to the progress of medicine, but such groups can never become a substitute for private practitioners. Many studies of illness and its treatment have agreed that not more than from 10 to 20 per cent of illnesses are benefited by being put through the exhaustive investigation and specialistic treatment characteristic of group practice. Moreover, not much more than 10 per cent of the 300 or more groups now in existence consist of any such well balanced body of specialists as these advocates of group practice visualize. Only a little over 16 per cent of the physicians in the United States claim to be specialists, and these are divided among seventeen specialties, seven of which are represented by less than 700 physicians. Many of these specialists are on hospital staffs or may be members of existing groups. Manifestly these are too few to form enough groups for a national medical service. Over 67 per cent of present groups are in towns of less than 50,000 population and only four of 239 are in cities with more than 1,000,000 population.<sup>1</sup> There is nothing magical about group practice that transforms poor physicians into good ones, makes medical service more available or lessens the cost. The value of the group depends on those who compose it. Group practice has not been combined with sickness insurance in any country, indeed, groups are forbidden by law in Germany, and even partnerships are frowned on in Great Britain.

<sup>4</sup> Madison R. R. and Manwaring W. H. *Proc Soc Exper Biol & Med* 37: 402 1937.

<sup>1</sup> Group Practice. Bureau of Medical Economics. Chicago. American Medical Association 1933 p. 14.

#### FEDERAL FUNDS FOR HEALTH EDUCATION

In the report to the president of Harvard University for 1936-1937 appears a section devoted to the School of Public Health, signed by Cecil K. Drinker, dean. Among the concluding paragraphs is a statement relative to the provision of funds from the Social Security Act for that school. This statement is offered for its bearing on agitation concurrently in effect relating to federal subsidies for medical education.

As a result of the operation of the Social Security Act, the School of Public Health has received from the federal government during the past two years \$16,855 in 1936-37, and \$12,600 in 1937-38. This money has been spent entirely for the training of students. Other institutions connected with public health have secured federal funds for much more general purposes, such as building construction, reasonably permanent personnel, etc. In other words, on account of the present compelling vogue of preventive medicine, the possibility confronts us of securing federal support for ordinary operations in the School of Public Health. The reception of a certain number of students on fellowships administered through the Social Security Act appears to me entirely appropriate, but, on the other hand, any vestige of dependence upon such funds for our necessary personnel, equipment, or budgets for research, in my opinion means inevitable lowering of standards in the school. Dependence on federal funds is, however, no more dangerous than dependence upon short-time financing through private organizations. Both lead away from the best possibilities for productive scholarship.

#### LATE RESULTS OF EPIDEMIC ENCEPHALITIS

According to Holt,<sup>1</sup> a diagnosis of epidemic encephalitis was made in the Boston Psychopathic Hospital 303 times up to the end of 1934. Only seven patients had the first symptoms prior to 1917 and twenty-five after the end of 1926. The remaining 271 had the first symptoms in the epidemic years from 1917 to 1926 and were the ones selected for the follow-up study. Thirty-one patients were interviewed at their homes by trained social service workers, sixty-one were examined by Holt, ninety-four patients had died, the condition of eight patients was reported by their private physicians, and forty-six patients could not be interviewed. From these studies it was concluded that, of seventy-eight patients first seen in the acute stage at the Boston Psychopathic Hospital, 11.5 per cent are alive and without known sequelae after from ten to sixteen years. Furthermore, the prognosis for lasting recovery appears not to be altered materially by the prominence of mental symptoms during the acute attack. It was also noted that, of ninety patients with sequelae observed from ten to seventeen years after the acute attack, 7.7 per cent are apparently recovered. Of seventy-two patients with sequelae observed more recently, but after a longer lapse of time since the acute attack, the rate of recovery was 1.4 per cent. Children with behavior disorders constitute the only group with sequelae of epidemic encephalitis in whom improvement may reasonably be expected.

<sup>1</sup> Holt W. L. Jr. *Epidemic Encephalitis*. *Arch Neurol & Psychiat* 38: 1135 (Dec) 1937.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Changes in Health Officers**—Dr. Felix R. Rossi, Jr. has been appointed health officer of Fairfield to succeed Dr. Carlton C. Purviance. Dr. Robert E. Austin has succeeded Dr. Raymond Spear as health officer of Coronado. Dr. James W. Creyer, Jr., Susanville, has been appointed health officer of Lassen County to succeed Dr. Clarence I. Burnett. The city of Banning has transferred the administration of its public health affairs to the Riverside County Health Department in charge of Dr. Wendell A. Jones, Riverside. The city of Shafter in Kern County was incorporated recently with Dr. Marcus W. Pascoe as health officer.

**Tenth Annual Seminar in Pharmacology**—The University of California Medical School, San Francisco, opened its tenth annual seminar in pharmacology, February 7, with a lecture by Chauncey D. Leake, Ph.D., on "Time-Action Curves." Dr. Leake dealt with "Concentration-Action Curves" February 14. Others in the series include:

James Morrison February 21 Pharmacology of Clinical Absorbents  
Joseph Schick February 28 Chemotherapy with Organic Antimonials  
Dr. Mayo H. Soley March 7 Anxiety and Effort Syndrome  
Cordon A. Alles Ph.D. March 14 Pharmacology in Inorganic Alkaline Earth Derivatives  
Joseph Swim March 21 Chemistry and Pharmacology of Cannabis  
March 28 Cannabis Addiction  
Max S. Marshall Ph.D. April 4 The Antiseptic 'Spectra'  
Charles Gurchot Ph.D. April 11 Co Enzymes April 18 Nicotinic Acid

### COLORADO

**Clinical Session**—The Mesa County Medical Society will present a "Western Slope Clinical Meeting" in Grand Junction April 3. The speakers will include:

Dr. Clarence B. Ingraham Denver Anesthesia and Analgesia in Obstetrics  
Dr. Louis E. Viko Salt Lake City Differential Diagnosis of Heart Lesions  
Dr. John G. Ryan, Denver Diagnosis and Treatment of Peptic Ulcer  
Mr. Harvey Sethman Denver The Inside of the Amendment Fight

**Society News**—The Medical Society of the City and County of Denver was addressed March 1 by Drs. Edward G. Billings on "Carotid Sinus Syncope," Dean W. Hodges, "Plastic Transplantation of Nipple," and Roy L. Cleere, "Explanation of New Method Blood Wassermann Reports."

—Dr. Benjamin E. Konwaler discussed "Sudden Death from Natural Causes" before the Pueblo County Medical Society February 15. Drs. John G. Wolf, Jesse W. White and Ray R. Taylor presented a symposium on eclampsia before the society February 1. All are from Pueblo.—Dr. Wilton A. Dav, Delta, discussed "Cardiac Neuroses" before the Delta County Medical Society recently.—The Northeast Colorado Medical Society was addressed in Sterling February 10 by Drs. Gerald M. Frumess and Robert S. Liggett, both of Denver, on "Syphilitic Lesions of the Mouth" and "Cardiovascular Syphilis" respectively.

### GEORGIA

**Personal**—Dr. Charles E. Wills has been appointed director of the Washington General Hospital, Washington.—Dr. Leo Smith, Waycross, has been appointed a member of the state board of medical examiners.—Dr. Gettis T. Sheffield, formerly of Washington, D. C., has been assigned as clinical director for the Veterans' Administration Facility, Augusta, effective March 1, succeeding Dr. Richard T. O'Neil, who has been transferred to Gulfport, Miss.

**District Meeting**—The Fifth District Medical Society will meet at the Academy of Medicine, Atlanta, March 31. Dr. Carl C. Aven, Atlanta, president of the Fulton County Medical Society, will deliver the address of welcome. Other speakers will be:

Dr. Dean H. Echols New Orleans Surgical Treatment of Hypertension  
Dr. George A. Traylor Augusta Exploitation  
Dr. Charles R. Rein New York Recent Advances in the Serology of Syphilis with Special Reference to the Application of the Kline Finger Blood Test in Routine Practice  
Dr. Burr V. Carter Cincinnati Surgical Treatment of Chronic Empyema

### ILLINOIS

**Vaccination of Teachers**—Public and parochial school authorities throughout the state will be asked to require the vaccination of teachers as a condition of employment and to urge on parents the vaccination of all children on entering school for the first time, in accordance with a new policy announced February 16 by the state department of health. A three months program is now under way to encourage the medical examination of children who expect to enter school for the first time next fall with emphasis being placed on vaccination against smallpox and inoculation against diphtheria. School authorities will be asked to consider the advisability of inserting a vaccination clause in the new contracts with teachers. The plan is designed to prevent periodic outbreaks of smallpox in Illinois.

### Chicago

**Military Medicodental Training Course**—The Illinois Military Area, Organized Reserves, U. S. Army, will hold a military medicodental training course for medical department reserve officers in Chicago March 27-April 9. This is the first to be held in Chicago. The morning hours will be devoted to clinics, lectures and classes in professional work for medical and dental reserve officers with the medical and dental schools of Chicago cooperating. There will be a general course in medicine and surgery and special courses on the eye, ear, nose and throat, urology and operative surgery. All the courses are offered without cost except the course in operative surgery, for which a small fee will be charged to cover the cost of the material used. The afternoons and evenings will be devoted to a program of military instruction under the direction of Col. Roy C. Hefebower, subjects will include tactics and technique of the combat arms, field sanitation, military hospital administration, military organization, medical service of the infantry division, the army corps and the field army. The military instructors will be regular army officers from the headquarters of the sixth corps area, the Illinois military area and Fort Sheridan. Speakers will include Major General Hugh A. Drum, commanding the second army and the sixth corps area, and Major General Charles R. Reynolds, surgeon general of the army.

**New Tumor Institute**—The Chicago Tumor Institute, 21 West Elm Street, was opened March 21. The institute is chartered in Illinois, not for profit, to conduct research on the causes, diagnosis and treatment of cancer, to instruct and assist physicians, surgeons, clinics and hospitals in the diagnosis and treatment of cancer and to train cancer specialists. About 200 physicians from all parts of the United States, Canada, South America, Mexico and the Hawaiian Islands have applied for courses of instruction in the institute. The building, four stories high, was formerly used by a private school and has been remodeled to suit the facilities of the institute. The first two floors are in active use and the third is given over to research laboratories, the fourth floor is not being used at present. There is a three story administration building connected with the clinic. Equipment includes two x-ray machines of medium voltage and two of the supervoltage type. There will be available 11 Gm of radium, 10 Gm of which will be used in the form of a radium bomb. Indigent persons suitable for radiation will be accepted at the clinic without charge. The trustees include Dr. Ludwig Hektoen, Arthur H. Compton Ph.D., Mr. Roy C. Osgood, Mr. Modie J. Spiegel, Mrs. Francis Neilson, Mrs. Arthur Meeker, Mr. Alfred Busiel, Dr. Max Cutler. The women's board includes Mrs. Meeker, who is chairman, Mrs. James Ward Thorne the vice chairman, Mrs. Harold Beacom, Mrs. Bruce Borland, Mrs. John Crerar, Mrs. Joseph M. Cudahy, Mrs. Gerhard Foreman, Mrs. Charles B. Goodspeed, Mrs. Neilson, Mrs. James R. Offield and Mrs. Kersey Coates Reed. The institute will be directed by a scientific committee consisting of Dr. Cutler, director, Dr. Henri Coutard of the Curie Institute, Paris, France, Sir George Lenthal Cheate, emeritus professor of King's College Hospital, London, England, Dr. Compton and Dr. Hektoen.

### INDIANA

**Professional Groups Form Council**—The five health groups of Indiana have organized a council known as the Inter-Allied Health Groups, according to the state medical journal. The council consists of five representatives from each of the following: Indiana State Medical Association, Indiana State Dental Association, Indiana Pharmaceutical Association, Indiana State Nurses Association and the Indiana Hospital Association. In addition there is one representative

from Purdue University and one from the state board of health. Indiana University is represented by several members on the council.

### KENTUCKY

**State Psychiatric Director Appointed**—Dr Joseph G Wilson, senior surgeon in the U S Public Health Service recently stationed in New York, has been appointed psychiatric director for the state department of public welfare to reorganize the medical staffs of the state's penal and charitable institutions. Dr Wilson is due for retirement July 1 from the service, but because of accumulated leave was able to take office in Kentucky March 1. Dr Wilson recently has been associated with the National Committee for Mental Hygiene in making surveys of mental institutions in various parts of the United States.

### LOUISIANA

**Longer Life Week**—Syphilis was the theme of the annual "Longer Life Week" in New Orleans sponsored by the Orleans Parish Medical Society March 20-26. Radio talks and addresses before civic, professional and community clubs were delivered by members of the society. Dr Thomas Benton Sellers, assistant professor of gynecology, Tulane University Graduate School of Medicine, New Orleans, was chairman of the program.

**Ernest S Lewis Memorial Night**—The Orleans Parish Medical Society and the New Orleans Gynecological and Obstetrical Society observed Ernest S Lewis Memorial Night at a joint meeting March 14. The occasion was in memory of Dr Charles Jefferson Miller, whose biography was presented by Dr Edward L King. Dr Walter W Chipman, emeritus professor of obstetrics and gynecology, McGill University Faculty of Medicine, Montreal was the guest speaker. His subject was "John Hunter, the First Scientific Surgeon."

### MICHIGAN

**The Beaumont Lectures**—Dr Herbert M Evans, professor of anatomy, Morris Herzstein professor of biology and director of the institute of experimental biology, University of California Medical School, San Francisco, will deliver the Beaumont Foundation Lectures, under the auspices of the Wayne County Medical Society, Detroit, March 28-29, his general subject will be "Physiology of the Pituitary Gland."

**Graduate Conference for Physicians**—The Wayne County Medical Society, Wayne University College of Medicine and the Detroit Department of Health are cooperating in a graduate conference for physicians at the Herman Kiefer Hospital Auditorium. The following program is announced:

- April 6 Drs John H Stokes Philadelphia The Practicing Physician and Syphilis Control Percy S Pelouze Philadelphia Treatment and Present Therapeutic Problems in the Control of Gonorrhea
- April 13 Drs Jesse G M Bullock New York Pneumonia Control Warren T Vaughan Richmond Va Serum Sickness
- April 20 Drs Leroy D Fothergill Boston Evaluation of Present Immunization Methods Edwin H Place Boston New Concepts and Developments of Treatment of Communicable Disease
- April 27 Drs William S Sadler Chicago Mental Problems of the Adolescent Winfred Overholser Washington D C Recognition and Treatment of the Early Case of Mental Illness

### MINNESOTA

**Personal**—Dr Walter P Gardner, Hastings, has been made superintendent of the Anoka State Hospital.—Dr James Eddy Arnold, Miles City, Mont, has been appointed village health officer and school physician for Mountain Iron.

**Dr Edgar Allen to Give Citizens Aid Lecture**—Edgar Allen, Ph.D, professor and chairman of the department of anatomy, Yale University School of Medicine, New Haven, Conn, will deliver the 1938 Citizens Aid Society Lecture at the University of Minnesota Medical School Minneapolis, April 12. His subject will be "Ovarian Hormones in Relation to Female Genital Cancer."

### NEW JERSEY

**Society News**—Dr Harrison S Martland, Newark, addressed the Passaic County Medical Society, Paterson, March 10 on "Interesting Cases from the Medical Examiner's Office." Dr Paul M Wood New York, addressed the society February 10 on "Anesthesiology, Its Scope and Prospects."—Dr Alfred Gordon, Philadelphia addressed the Gloucester County Medical Society March 17 on "Heredity and Environment."—At the annual meeting of the Cape May County Medical Society at Ocean City April 6, speakers will include Drs Leroy A Wilkes, executive officer of the Medical Society of New Jersey, Trenton on "State Society Plans for Maternal

Welfare and Child Health", Julius Levy, Newark, and Arthur W Bingham, East Orange, maternal and child welfare.—Dr Thomas R Brown, Baltimore, addressed the Atlantic County Medical Society March 11 on "Gastro-Enterology in General Practice."—Dr Lewis C Scheffey, Philadelphia, addressed the Camden County Medical Society, Camden, March 1, on "Problems Encountered in the Diagnosis and Treatment of Carcinoma of the Uterus."

### NEW YORK

**Personal**—Dr Earle G Brown, former state health officer of Kansas and recently director of health and welfare in Arlington County, Va, has been appointed commissioner of a newly established health unit in Nassau County.

**Dr Whipple Receives Mickle Award**—Dr George H Whipple, dean of the University of Rochester School of Medicine and Dentistry, Rochester, has received the Charles Mickle Fellowship of the University of Toronto, in recognition of his work on pigment metabolism and regeneration of hemoglobin. This fellowship is the annual income from an endowment fund of \$25,000 and is awarded to the scientist who, in the opinion of the council of the university, has done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science.

### New York City

**Salmon Memorial Lectures**—Dr David Kennedy Henderson, physician superintendent of the Royal Edinburgh Hospital for Mental Disorders, Edinburgh, Scotland, will deliver the sixth series of Thomas William Salmon Memorial Lectures at the New York Academy of Medicine, April 18, 19 and 20. Dr Henderson is also professor of psychiatry in the University of Edinburgh and the author of numerous publications on psychiatric subjects. The topic of his lectures will be "Psychopathic States Considered from the View of (1) Their Place in Psychiatry, (2) Their Characteristics as Evidenced by Aggression, Inadequacy and Creativeness, (3) Their Understanding and Synthesis."

**New City Board of Health**—Under the new city charter which went into effect January 1, changes have been made in the city board of health. The board consists as before of five members, one being the commissioner of health, who is designated chairman (formerly called "president"). The commissioner's term of office is not specified and this appointment is therefore liable to change with the city administration. The new charter prescribes the terms of the other members as eight years, providing at first for appointments of two, four, six and eight years, so that one member will be appointed every two years. The new plan also requires that four members of the board be physicians with certain qualifications. The mayor has appointed the following board: Drs John L Rice, chairman, Haven Emerson, John E Jennings and Carl Boettiger and Mr David M Heyman.

**Cameron Prize Awarded to Dr Landsteiner**—The Cameron Prize of the University of Edinburgh, Scotland, has been awarded for 1938 to Dr Karl Landsteiner, member of the Rockefeller Institute for Medical Research. Science reports Dr Landsteiner is honored for his research on isohemagglutinins and blood groups and for the influence of his work on the practice of therapeutic blood transfusion. The Cameron Prize award is made annually by the university on the recommendation of the faculty of medicine to a person who in the five years immediately preceding has made any highly important and valuable addition to practical therapeutics. In recent years it has been awarded to Drs George F and Gladys R H Dick, Chicago (1933), George R Minot and William P Murphy, Boston (1930), and Harvey Cushing, New Haven, Conn (1924). It amounts to about £200.

### NORTH CAROLINA

**Dr Royster Honored**—Dr Hubert A Royster, Raleigh, for many years prominent in medical affairs in North Carolina, was honored at a testimonial dinner given by the Wake County Medical Society, former students and associates in the medical profession at the Carolina Hotel, Raleigh, March 10. Among physicians who paid tribute to Dr Royster were Drs William de B MacNider dean, University of North Carolina School of Medicine Chapel Hill Wingate M Johnson, Winston-Salem, president of the Medical Society of North Carolina, Thomas W M Long, Roanoke Rapids secretary of the state medical society, and Donnell B Cobb Goldsboro. Dr Charles P Eldridge, Raleigh, presented a silver serving tray to Dr Royster, the gift of the county society. Dr Roys-

ter, a native of Raleigh, is 66 years old. He graduated from the University of Pennsylvania School of Medicine in 1894. From 1902 to 1910 he was dean of the University of North Carolina Medical School, then in Raleigh. He was secretary of the state board of medical examiners from 1914 to 1920 and has been president of the Raleigh Academy of Medicine, the Wake County society, the state medical society and the Southern Surgical Association. At present he is chief of the surgical service at Rex Hospital and St. Agnes Hospital, Raleigh, and consulting surgeon for the North Carolina Hospital for the Insane at Dix Hill, where a building is named in his honor. He is also professor of surgery at Wake Forest College School of Medicine and is the author of two textbooks and a volume of essays.

## OHIO

**Personal**—Dr. Louis P. H. Bahrenburg, who recently retired as director of the Marine Hospital, Cleveland, has been made an honorary member of the Academy of Medicine of Cleveland.—The Lake County Medical Association recently voted an honorary life membership to Dr. Julian V. Winans, Madison, marking his fiftieth anniversary in the practice of medicine. Dr. Winans has been president of the society, served as county coroner and has been since 1920 president of the county board of health. He has also served in the legislature and during the World War was in the U. S. Army Medical Corps, stationed at Newport, R. I., and New London, Conn.—Dr. Joseph Blickensderfer, health officer of New Philadelphia, was honored by the Tuscarawas County Medical Society, January 14, with a testimonial dinner celebrating his completion of fifty years of practice. Speakers included Drs. Morrison W. Everhard, New Philadelphia, Daniel W. Shumaker, Dover, Mary Elizabeth Rowland, Gnadenhutten, James A. McCollam, Uhrichsville, and Dr. Blickensderfer.

## PENNSYLVANIA

**Free Serum Distributed**—The state department of health distributed \$24,000 worth of free pneumonia serum in the recent campaign, newspapers reported March 6. The serum, of types I and II, was sent to 191 hospitals, where 493 persons were treated. The department has recently arranged to keep on hand scrums for types V, VII, VIII and XIV for emergency calls.

### Philadelphia

**Symposium on Air Hygiene**—The section on public health, preventive and industrial medicine of the College of Physicians of Philadelphia presented a symposium on air hygiene March 7, with the following speakers: Philip Drinker, Ch. E., Boston, on "Air Pollution and Occupational Disease"; Dr. Joseph Stokes Jr., "Recent Studies on Immunity to Air-Borne Infections," and Mr. William F. Wells, "Prevention and Control of Air-Borne Infections."

**Woman's Auxiliary Sponsors Health Institute**—The Woman's Auxiliary to the Philadelphia County Medical Society will present its eighth annual health institute April 12 in the auditorium of the county society. The general subject of the institute will be "Recent Developments in Medicine." Addresses will be delivered by the following physicians:

- Dr. John Royal Moore: Modern Advances in Orthopedic Surgery
- Dr. Catharine MacFarlane: The March of Time
- Dr. John D. McLean: New Methods in the Treatment of Tuberculosis
- Dr. George M. Coates: Causes and Prevention of Various Types of Deafness
- Dr. Harry B. Wilmer: Allergic Diseases: Early Recognition and Treatment
- Dr. Joseph C. Doane: Diagnosis Old and New
- Dr. Frank H. Krusen: Rochester Minn. Recent Developments in One of the Newest Fields of Medicine (physical therapy)

## UTAH

**Hospital News**—A new thirty-four bed hospital was dedicated in Payson January 30, it will be operated by Drs. Asa L. Curtis, Lynn D. Stewart and Merrill L. Oldroyd, Payson.

**Personal**—Dr. Ellis R. Shipp, Salt Lake City, was honored recently at a testimonial sponsored by the Daughters of Utah Pioneers. Dr. Shipp was born Jan. 20, 1847, and graduated from the Woman's Medical College of Pennsylvania in 1878.

## VERMONT

**Chiropractors Not Authorized to Use Electrical Appliances**—The attorney general of Vermont recently issued a ruling giving it as his opinion that chiropractors are without authority to engage in the curative treatment of disease by the use of electrical appliances. The statement was addressed to Dr. W. Scott Nay, Underhill, secretary, Vermont State

Board of Medical Registration, who asked for an opinion on an advertisement by a Brattleboro chiropractor of an "ultra short wave therapy machine" which would "heal an x-ray burn or take the color out of a black eye." The attorney general held that "the practice of a chiropractor, unless otherwise provided by statute, is limited to treatment of disease by methods recognized under his particular system of healing which system treats diseases by manipulation of the spinal column. I am also of the opinion that the subjects on which a chiropractor has been examined should be considered in determining the legislative intent as to just how far a chiropractor can go in treatment of disease." According to news paper reports, he added that the board of chiropractic examiners might convince him he was wrong and that ultimately the supreme court will have to pass on the question.

## WYOMING

**Central Wyoming Meeting**—The second annual Central Wyoming District Medical meeting, sponsored by the Wyoming State Medical Society and arranged by the Natrona County Medical Society, will be held at Casper April 2-3. Guest speakers will be:

- Dr. Howard B. Hamilton: Omaha. Chest Conditions in Children
- Dr. Arnold Minnig: Denver. Some Diagnostic Difficulties in Toxic Thyroid
- Dr. Charles W. Pollard: Omaha. An Ideal Technique in Care of Obstetric Cases
- Dr. Osgood S. Philpott: Denver. Diseases of the Skin Which Puzzle the General Practitioner
- Dr. Robert D. Schrock: Omaha. Infantile Paralysis—Orthopedic Treatment
- Dr. Thomas D. Cunningham: Denver. Some Phases of Heart Disease of Interest to the General Practitioner

There will be a banquet at the Henning Hotel Saturday evening, with Dr. George M. Anderson, Cheyenne, as toastmaster.

## GENERAL

**Society News**—Dr. Robert L. Sanders, Memphis, was chosen president-elect of the Southeastern Surgical Congress at the annual meeting in Louisville, Ky., March 7-9. Dr. Thomas C. Davison, Atlanta, became president and Dr. Elmer L. Henderson, Louisville, was made vice president. The 1939 meeting will be in Atlanta.

**Prison Sentences for Eyesight Swindlers**—Harold N. Baxley and Curtis J. Yeager, charged with conspiracy and fraudulent use of the United States mails in fake eye specialist swindles, were recently sentenced to serve four years in the federal penitentiary at Atlanta, Ga., on completion of the five year sentences they are now serving in the state prison at Richmond, Va., for convictions of similar offenses. Guy W. Reynolds, another swindler, was sentenced to serve a year and a day at the federal prison at Leavenworth, following his plea of guilty at Abilene, Texas, recently, to fraudulent use of the mails.

**The Kober Lecture**—Dr. Wallace M. Yater, professor of medicine Georgetown University School of Medicine, Washington, D. C., will deliver the annual Kober Lecture at the university March 28. His subject will be "Gout and the Heart: An Exposition of the Present Status of Our Knowledge of the Subject, Including Original Research Work in This Field." The lecture is sponsored by the Kober Foundation. The speaker is selected on alternating years by the Medical Society of the District of Columbia, the Association of American Physicians and the Association of Military Surgeons.

**Association for Thoracic Surgery**—The twenty first annual meeting of the American Association for Thoracic Surgery will be held at the Biltmore Hotel, Atlanta, Ga., April 4-6 under the presidency of Dr. Stuart W. Harrington, Rochester, Minn. Included on the program will be the following speakers:

- Dr. Ronald Belsey: London, England. Extrapleural Pneumothorax
- Dr. Joseph A. Weinberg: Omaha. Treatment of Acute Empyema
- Thoracis by Open Intercostal Drainage
- Dr. Isaac A. Bigger: Richmond, Va. Wounds of the Heart
- Drs. Everts A. Graham and Brian B. Bladys: St. Louis. Observations on Mediastinal Tumors: A Study of Fifty Two Cases Excluding Aneurysms and Substernal Thyroids
- Dr. James Samuel Binkley: New York. Aspiration Prophy of the Lung
- Drs. Pol A. Coryllos and George G. Ornstein: New York. Tension (Giant) Tuberculous Cavities: Pathogenesis, Mechanics and Surgical Management
- Dr. Jerome R. Head: Chicago. Extrapleural Thoracoplasty: Further Experiences with the Multiple Stage Muscle Splitting Operation
- Dr. John C. Jones: Los Angeles. Lobectomy and Pneumonectomy in Pulmonary Tuberculosis
- Dr. Edward William Alton Ochsenr: New Orleans. Operative Correction of Pectus Excavatum: Report of a Case and Review of the Literature
- Dr. Otto C. Pickhardt: William H. Stewart and Grant Thorburn: New York. Cinefluoroscopic Studies of Peculiar Breathing and Chest Motion



**Federation of Societies for Experimental Biology**—The annual meeting of the Federation of American Societies for Experimental Biology will be held at the Lord Baltimore Hotel, Baltimore, March 30-April 2. The federation is made up of four societies: American Physiological Society, American Society of Biological Chemists, Inc., American Society for Pharmacology and Experimental Therapeutics, Inc., and the American Society for Experimental Pathology. There will be a joint meeting of the federation Thursday morning with the following speakers:

Dr. Nathan B. Eddy, Ann Arbor, Mich.: The Search for More Effective Morphine-like Alkaloids.  
Dr. Ernest W. Goodpasture, Nashville, Tenn.: Experimental Virus and Bacterial Infections of the Chick Embryo.  
Henry C. Sherman, Sc.D. and Harriet L. Campbell, Ph.D., New York: Experimental Studies of the Relation of Nutrition to Length of Life.  
Dr. Carl J. Wiggers, Cleveland: The Dynamics of Hypertension.

This year the American Physiological Society is celebrating its fiftieth anniversary. The program includes section meetings on endocrinology and metabolism, circulation, central nervous system, gastro-intestinal activity, choroid plexus, electrolytes and water balance, the heart, nerve fibers and reflexes, bile secretion, liver lipids and appetite, special senses and general physiology and energy metabolism. In addition a symposium on anoxia will be presented.

Dr. Edgar S. Guzman Barron, Chicago: Anoxia and Cellular Oxidations I. Enzymatic Processes.  
Dr. Ralph W. Gerard, Chicago: Anoxia and Cellular Oxidations II. Metabolism of Nervous Tissues.  
David Bruce Dill, Ph.D., Arlington, Mass.: Respiratory Adaptation to Low Oxygen Pressure.  
Dr. Ernst Gellhorn, Chicago: Cardiovascular Changes in Anoxia.  
Ross A. McFarland, Ph.D., New York: Psychologic Effects of Anoxia.  
Dr. Dickinson W. Richards, Jr., New York: Anoxia in Clinical Medicine.  
Capt. Harry G. Armstrong, Dayton, Ohio: Anoxia in Aviation.

Speakers on the biochemistry program include:  
Ralph I. Dorfman, Ph.D., New Haven: Excretion of Androgenic Substances After the Administration of Testosterone.  
Harry G. Day, Sc.D., Harold J. Stein and Elmer V. McCollum, Ph.D., Baltimore: Effect on Hematopoiesis of Variations in Levels of Calcium, Phosphorus and Iron in the Diet.  
Clive M. McCay, Ph.D. and A. V. Tunison, New York: Toxicity of Linseed Meal.  
Byron M. Hendrix, Ph.D. and Joe Dennis, B.A., Galveston: Changes of Nitrogen Content Brought About by Denaturation of Proteins.  
Papers to be read at the meeting of pharmacologists include:  
Dr. Charles M. M. Gruber, Victor G. Huxley and Charles M. Gruber, Jr., Philadelphia: The Point of Action of the Barbiturates in Depressing the Cardiac Vagus Nerve.  
Drs. Torald H. Sollmann and Joseph Seifter, Cleveland: Pharmacology of Bismuth Trimethyl.

Friday afternoon Dr. George B. Wallace, New York, will address the pharmacologists at luncheon on "The Status of Pharmacology in the Medical Curriculum."

The pathologists will be addressed by the following, among others:

Dr. Arthur J. Vorwald, Saranac, N.Y.: The Influence on the Natural and Acquired Resistance to Tuberculosis.  
Dr. Dale Rex Roman, Philadelphia: Effect of Protosil and Related Compounds on the Chemotaxis of Leukocytes.

A joint session of the biochemists and physiologists on vitamins will be held Saturday morning. The annual smoker will be held Thursday evening, March 31, and the annual dinner, observing the fiftieth anniversary of the physiologists society, Friday evening.

## FOREIGN

**Combined Congresses on Tropical Medicine and Malaria**—The third International Congress of Tropical Medicine will be held in Amsterdam, September 26-October 1. Combined with it will be the third International Malaria Congress, which was to have been held in Madrid in October 1936. The malaria section will be independent to a considerable extent and its reports will be printed in a separate volume. Subjects to be discussed at the tropical medicine meeting will be deficiency diseases, yellow fever, Leptospira and filariasis. For the malaria congress the following subjects are planned: varieties of anophelines, strains of parasites, treatment with quinine and with the new synthetic drugs, prophylaxis, sanitation and colonization. The congress will also include a section for comparative tropical pathology in which the subjects will be deficiency diseases, measures against hydrophobia, rickettsia and extermination of the tsetse fly.

## CORRECTION

**Barber "Physiology for Pharmaceutical Students"**—In the review of this book, published in THE JOURNAL, March 5, the price quoted was \$2 as sent to this office by the publishers. Later information indicates that the price is \$4.50.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb. 26, 1938

### High Voltage Roentgen Therapy

At the Medical Society of London an important discussion on high voltage therapy was opened by Dr. J. H. D. Webster, radiologist, who said that the results depended on many factors: the site of the lesion, the stage of the disease and the state of the patient. Ewing had said that the best prospect was in an active growth in an active patient. Another important factor was the quantity and quality of the dose and the intervals. Minimal doses had a stimulating effect. Some surgeons sent patients for a small irradiation of the spleen before gallbladder operations to improve the coagulation time of the blood and increase the output of platelets. Small doses applied to the ovaries and pituitary gave good results in obstinate amenorrhea and sterility. Stimulation of the bone marrow with doses about one twentieth of an erythema dose were of value in granulocytopenia.

High voltage therapy was useful also in infective and inflammatory conditions. Acute furunculosis of the face responded to small doses, and carbuncles had been successfully treated, but not advanced cases associated with diabetes. Many American clinics reported good results in rhinitis, nasal sinusitis and acute mastoiditis. X-rays were worth trying in tonsillitis, especially when operation was undesirable. In endocarditis one tenth of an erythema dose to the heart had given better results than medical treatment. In glandular hyperplasias and functional overactivities, such as prostatic hypertrophy, exophthalmic goiter, lesions of the anterior lobe of the prostate and overactivity of the anterior pituitary, the results were promising. In enlargement of the prostate Dr. Webster had obtained improvement in nocturnal frequency, residual urine and other symptoms. In Cushing's syndrome and acromegaly also results were good. Patients with Addison's disease had greatly benefited from irradiation of large surfaces of the body at a distance of 1 or 2 meters (teleroentgen therapy).

In many allergic conditions—asthma, psoriasis, pruritus and eczema—X-rays acted as a desensitizer. In rare blood conditions, such as lymphatic leukemia and polycythemia, they were almost the only treatment. The best results were obtained by treating the spleen and glands locally at first and holding distant therapy in reserve in case of a relapse.

In operable cancer of the gastro-intestinal tract and gallbladder and probably also of the kidney, operation was the method of choice though preoperative irradiation might be desirable, especially in children. The same observation applied to cancer of the bladder. Surgery was also better for carcinoma of the body of the uterus and sarcoma of bone, but for cancer of the skin, lip, cervix, mouth, pharynx, penis, testis and Ewing's and one or two other sarcomas, especially of soft parts and glands, X-rays were better. He did not believe that anything was to be gained by pushing up the voltage.

### Bill to Abolish Night Baking

In the House of Commons a medical labor member, Dr. Haden Guest, moved the second reading of a bill to abolish the night baking of bread, which is carried out to supply the public with fresh bread for breakfast. Dr. Guest said that among bakers there was a high death rate from tuberculosis, alcoholism and bronchitis and that hernia was excessively fatal. Pulmonary tuberculosis was the obvious result of the dust, heat and conditions under which they worked, alcoholism was a refuge for persons with frayed nerves. The high death rate from hernia was a grave condemnation of the conditions under which they worked. Opposition to the bill gave rise to the

objection that, if baking did not start until 5 a. m., fresh bread could not be obtained until the afternoon. The second reading of the bill was carried by a majority of 147 to 126.

## PARIS

(From Our Regular Correspondent)

Feb. 26, 1938

### Efforts to Diminish the Number of Medical Students

For several years there has been a noticeable decrease in the number of matriculations at the various medical schools, so that it was found unnecessary to have passed a bill first introduced by Dr. Portmann of Bordeaux. According to this proposed law, all students in the preliminary (basic sciences) year as well as those who had completed their first year at the medical school were to be given special examinations in order to eliminate those considered to be incapable of continuation of their studies. According to Dr. Cibrie, secretary of the association which looks after the public relations interests of the profession in France, the number of medical students had shown an increase of 184 in 1937 over the preceding year. He recommended the passage of the Portmann bill with the object of giving eliminatory tests before the student enters his second year of the medical curriculum.

### Naturalization of Foreign Physicians and Medical Students

Statements have appeared from time to time that the number of foreign physicians who were being naturalized had reached figures which alarmed the French medical profession. Last year an article was published to the effect that more than 3,000 physicians from Germany had become French citizens in the preceding twelve months, and one speaker at a general medical meeting said that the rate of naturalization had attained ninety a day. At the February 15 meeting of the Confederation des syndicats médicaux de France, the official organization which looks after the interests of the entire profession, these statements were said to be grossly exaggerated. During 1935 fifteen physicians and four medical students were naturalized. This number rose to forty-eight and fifty-four respectively in 1936 and to eighty-eight and forty-nine up to Dec. 4, 1937.

### Digestive Route in the Transmission of Typhus Virus

At the February meeting of the Académie de médecine a paper was read by Dr. Le Chuiton and three other naval officers on transmission of murine typhus virus through food which has been contaminated by the urine of virulent rats. Marcandier and Piroet in 1933 demonstrated the presence of the virus of murine typhus in the urine of rats. Nicolle and his associates in the same year were able to infect rats by the digestive route. Others have shown that this possibility holds true for the cat and the dog. A series of experiments by the authors of the present paper revealed the possibility of keeping intact the virus of murine typhus outside the body of animals for a period of at least forty-eight hours. This shows that contamination of food by the urine of infected animals is possible. It was observed that (a) in the large naval vessels stationed at Toulon in the south of France the incidence of typhus reaches its maximum between September and December, i. e., when the incidence of fleas is at its lowest, (b) there was no history of flea bites in those who were infected with typhus, and (c) the disease did not occur among the officers whose food is immediately well protected against contamination by rats. Special precautions were taken to prevent access to the bread supply by rats on all French naval ships and instructions given to the crews to avoid eating any food which could have been contaminated by rats. The result has been a marked reduction in the number of cases. The incidence per thousand sailors in 1937 was only 1.13 per cent as compared to percentages varying from 4.42 to 12.36 in the six preceding years.

### Accidents Following Lumbar Puncture in Cases of Hypertension

At the January 7 meeting of the Société médicale des hôpitaux of Paris, a paper on accidents following lumbar puncture in cases of hypertension was read by Drs. Riser, Planques and Becq of Toulouse. Lumbar puncture has been employed in cases of hypertension to relieve the distressing headaches, vertigos and retinitis so frequently incident to hypertension. The amelioration of these symptoms after lumbar puncture is marked in the majority of cases. In the present paper the histories of five patients were cited in whom the lumbar puncture was not well tolerated in one and was immediately followed by death in four others. In the first case after the lumbar puncture there was a marked drop in the systolic and diastolic blood pressure, which rose immediately after injection of epinephrine. In two of the four fatal cases, the quantity of cerebrospinal fluid which was allowed to escape was larger than it should have been. An intense headache resulted and a few hours later the patients became comatose and died. In the other two fatal cases the amount of fluid was relatively small and it was withdrawn slowly. Nevertheless the headache, which had been temporarily improved, recurred in more intense form, accompanied by a confusional mental state. Death took place in one case on the second and in the other on the tenth day following the lumbar puncture. These are the only accidents which the authors have observed in more than 150 cases of hypertension in which this method was employed. The mechanism of these accidents appears to be a disturbance of the complex tensional equilibrium, resulting in a sudden and severe vasodilatation similar to the acute hemorrhagic swelling of the brain as seen in neurologic surgery.

### Death of Professor Sabouraud

Through the death of Prof. Raymond Sabouraud, France loses a dermatologist of international reputation. His aim throughout his career was to concentrate on certain problems and among these was the study of the diseases of the scalp, in which field Sabouraud was one of the pioneers. His research in this subject appeared in a book entitled *Diseases of the Scalp*, which has been translated in many countries. His *therapeutic armamentarium* included only about a dozen preparations and the use of radiotherapy, but he was very successful in their application to the frequently resistant disorders of the scalp. He was not only a celebrated dermatologist but also a gifted sculptor.

## BERLIN

(From Our Regular Correspondent)

Feb. 7, 1938

### Studies of Wounds Caused by Bites

The therapy of wounds caused by bites is at all times unsatisfactory, chiefly on account of the frequent subsequent phlegmon and general infection which endanger life. Infection with actinomyces and echinococci have always been observed to follow bites. According to a report compiled by Dr. F. Jaeger of the Munich University Surgical Clinic thirty-five agricultural societies reported a total of 8,906 cases of wounds caused by bites within a five year period. In 661 of these cases the societies granted accident benefits for the injury. Dr. Jaeger observed at the Berlin University Surgical Clinic 148 cases of lesions caused by bites and another 159 similar cases at his own clinic in Munich. The vast majority of the bites were inflicted by dogs. The second greatest number of bite wounds were inflicted, in Berlin by other humans, in Munich by cats, and the third greatest number at Berlin by cats and at Munich by human beings. These clinical cases represented only bite wounds which came to surgical treatment. Germicidal substances were also important, Dr. Jaeger particularly recommended zinc peroxide which liberates active oxygen. The wound is "flooded" with this powder and then bandaged.

### Foundation of a Docents' Academy

Late in January the first wissenschaftliche akademie des nationalsozialistischen studentenbundes (learned academy of the nazi students' league) was opened at Kiel under the sponsorship of the university faculty. The foundation of similar bodies in conjunction with other German universities is contemplated. President of the new Kiel Academy is Prof. Dr. H. Loehr, ordinarius in internal medicine and provincial fuhrer of docents. In his inaugural address he contrasted the new foundation with the older academies and especially with the renowned Preussische Akademie der Wissenschaften of Berlin. His remarks reflect the authoritative opinions of present-day Germany. The new academy, he said, does not seek to imitate "cosmopolitan humanistic learned groups," the background of which is largely Romanic and Renaissance. Nor has it anything in common with those humanistic societies which are show pieces of the absolutism of princely courts, both ecclesiastical and temporal. The older academies were without social-political and nationalistic functions and therefore they deteriorated into mere "assemblies of the masters," namely, so many legions of honor, or councils of venerable men who had lost contact with the world of affairs. The new academy, on the contrary, envisages among its duties "the elaboration of a science the principles and programs of which are fundamentally and purposefully in accord with the totalitarian and traditional ideals of German life, the revival of the universitas literarum and the inward transformation of German university docents into stanch, politically minded men whose weltanschauung and scholarship will attest the vital reality and unity of the well rounded, educated person." The attainment of this goal implies a strenuous combat against all efforts to break down the universities into a system of professional schools. Loehr further declared that neither public decrees nor organizations can create the new university. Its success will depend on a new type of docent, he will have to discover for himself a realistic synthesis of weltanschauung, politics and learning. The concept of a scientific basis for the nazi weltanschauung should be discarded. The union of weltanschauung and political philosophy has now been restored through acceptance of certain racial principles as scientific axioms. The ideal aim of the new academy is not a restriction of its membership to a few men or a division into sections, but the training of docents who will possess in equal measure a faith in the nazi weltanschauung and proved scholarly abilities. Visionary and vague philosophies have no place here. A meeting of the new academy should resemble "a festival hall in the Germanic-German tradition." In addition to its scholarly endeavors the new body will actively oppose the enemies of reconstructed German science. Thus will be attested to posterity that the first generation of nazi scholars were participants in a great renaissance of German learning.

Meanwhile the establishment of three other docents' academies has been announced: one at Heidelberg, one at Gottingen and, most recent of all, one at Tubingen. These bodies are all products of a spontaneous initiative on the part of the universities in question and did not originate in any government order. Each of the new academies will develop as an individual unit.

### Marriages

VICTOR SPENCER HUGGINS, Evansville, Ind., to Dr. KATHERINE CHAMBERLAIN HARVEY of Richmond, Va., January 29.

WILLIAM MASON JENNINGS JR., St. Marys, Ohio, to Miss Jane May Wright of Toledo, Dec. 29, 1937.

WILLIAM L. PELTZ, Albany, N. Y., to Miss Margaret Ruth Adams of Exeter, N. H., January 29.

LANN D. ABERNETHY, Pontotoc, Miss., to Miss Georgia Robertson of Corinth, Dec. 21, 1937.

ANDREW BAXTER BYERLI, Cooleemee, N. C., to Mrs. Sally Evans Grimes in January.

### Deaths

DUNCAN LORNE ALEXANDER, Twin Falls, Idaho, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903, past president of the Idaho State Medical Association, fellow of the American College of Surgeons, served during the World War, on the staffs of the Gooding County Hospital, Gooding, St. Valentine's Hospital, Wendell and the Twin Falls General Hospital, aged 56, died, January 5.

GUY CLIFFORD FRENCH, Phoenix, Ariz., St. Louis University School of Medicine, 1926, past president and secretary of the Maricopa County Medical Society, fellow of the American College of Surgeons, aged 45, on the staffs of the Good Samaritan Hospital and St. Joseph's Hospital, where he died, January 31, of pulmonary thrombosis.

PEARL CALEB WEST, Sedro Woolley, Wash., Saginaw Valley (Mich.) Medical College, 1902, Columbia University College of Physicians and Surgeons, New York, 1911, member of the American Society of Clinical Pathologists, served during the World War, pathologist to the Northern State Hospital, aged 66, died, Dec. 31, 1937.

FRANK WHITE MACMANUS, Buhl, Idaho, University of Wooster Medical Department, Cleveland, 1891, Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1908, served during the World War, aged 70, died, Dec. 15, 1937, in Twin Falls, following an automobile accident.

KATHARINE REBECCA MOSES, New Harrisburg, Ohio, Ohio Medical University, Columbus, 1900, member of the Ohio State Medical Association and the American Psychiatric Association, formerly on the staff of the Cleveland State Hospital, aged 67, died, Dec. 16, 1937, of chronic nephritis and arteriosclerosis.

JOHN C. RYDER, Eaton, Ohio, Hahnemann Medical College and Hospital of Philadelphia, 1894, formerly member of the village board of public affairs and member of the board of education, aged 68, died, Dec. 17, 1937, in the Miami Valley Hospital, Dayton, of coronary thrombosis.

ARTHUR SOPER ARMSTRONG, New York, Cornell University Medical College, New York, 1904, fellow of the American College of Surgeons, surgeon to the Knickerbocker and Misericordia hospitals, served during the World War, aged 58, died, January 13, of coronary occlusion.

CHRISTOPHER GARELD BRETHOUWER, Montrose, Colo., Lincoln Medical College of Cotner University, 1901, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905, aged 61, died, Dec. 27, 1937, of carcinoma of the sigmoid.

CHARLES LEONARD ROOT, Colorado, Texas, Atlanta (Ga.) College of Physicians and Surgeons, 1909, president of the Mitchell County Medical Society, medical director of a hospital bearing his name, aged 67, died, Dec. 10, 1937, in a hospital at Abilene, of myocarditis.

JOSEPH PETERFIELD TRENT, Farmville, Va., George Washington University School of Medicine, Washington, D. C., 1906, member of the Medical Society of Virginia, aged 70, died, Dec. 27, 1937, in Warrenton as the result of injuries received in an automobile accident.

HEZZIE D. BULLOCH, Covington, La., University of the South Medical Department, Seawane, Tenn., 1903, secretary and past president of St. Tammany Parish Medical Society, for many years parish coroner, aged 55, died, January 31, of coronary occlusion.

ROWE GEORGE GALE, Vancouver, Wash., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900, member of the Washington State Medical Association, aged 61, died, January 1, of cerebral hemorrhage.

JOHN WILLIAM DAWSON, Houston, Texas, Southwestern University Medical College, Dallas, 1910, member of the State Medical Association of Texas, aged 53, died, Dec. 23, 1937, in the Methodist Hospital, of bronchopneumonia and cerebral thrombosis.

SAMUEL A. WORSTALL, Aroma Park, Ill., Jefferson Medical College of Philadelphia, 1882, member of the Illinois State Medical Society, aged 79, died, Dec. 12, 1937, in St. Mary Hospital, Kankakee, of hypertensive heart disease and pyonephrosis.

JACOB RESNIK, New York, Albany (N. Y.) Medical College, 1917, member of the Medical Society of the State of New York, served during the World War, aged 43, died, Dec. 26, 1937, at the Jewish Memorial Hospital, of Ludwig's angina.

**John Lee White**, Sandhill, Miss., Memphis (Tenn.) Hospital Medical College, 1904, member of the Mississippi State Medical Association, aged 56, died, Dec 3, 1937, in New Orleans, of lymphatic leukemia, acute hepatitis and splenitis

**Herbert Washburn Bearce**, Port Orange, Fla., Long Island College Hospital, Brooklyn, 1884, member of the Florida Medical Association, on the staff of the Halifax Hospital, Daytona Beach, aged 79, died, Dec 19, 1937, of myocarditis

**George Banks**, Patterson, N. Y., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1884, for many years member of the city board of health and coroner, aged 79, died, Dec 11, 1937, of arteriosclerosis

**Terry W. Warner**, Parker, Kan., Northwestern Medical College, St. Joseph, Mo., 1892, University Medical College of Kansas City, Mo., 1898, member of the Kansas Medical Society, aged 74, died, Dec 28, 1937, of cerebral embolism

**James Walter Seawell**, Healdsburg, Calif., University of California Medical Department, San Francisco, 1901, health officer, on the staff of the Healdsburg General Hospital, aged 58, died, Dec 26, 1937, of chronic myocarditis

**Joseph Leopold Sameth**, Welch, W. Va., Bellevue Hospital Medical College, New York, 1898, member of the West Virginia State Medical Association, aged 69, was found dead in bed, Dec 23, 1937, of cerebral hemorrhage

**Russell Welcome Tennant**, Long Beach, Calif., University of Minnesota College of Medicine and Surgery, Minneapolis, 1899, aged 60, died, Dec 31, 1937, in the Seaside Hospital, of carcinoma of the lower jaw

**Dante Angelo Becchetti**, Chicago, Loyola University School of Medicine, Chicago, 1931, resident physician to the Martha Washington Hospital, aged 33, died, January 1, of coronary thrombosis

**William G. Malcolm**, Chetek, Wis., Queen's University Faculty of Medicine, Kingston, Ont., 1893, for many years bank president, aged 71, died, Nov 27, 1937, of uremia, nephritis and arteriosclerosis

**Wilson H. Rothermel**, Reading, Pa., Jefferson Medical College of Philadelphia, 1894, formerly county coroner, aged 71, died, Dec 21, 1937, in the Homeopathic Hospital, of cerebral hemorrhage

**John Wesley Sanborn**, Newton, Mass., Harvard University Medical School, Boston, 1896, served during the World War, aged 70, died, Dec 5, 1937, at Newton Center, of heart disease

**William Fales Hathaway**, Weymouth, Mass., Hahnemann Medical College of Philadelphia, 1869, Civil War veteran, aged 94, died, Dec 25, 1937, of myocarditis and hypostatic pneumonia

**Frank Caryl Dakin**, Evanston, Ill., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890, aged 69, died, January 2, of heart disease

**George Wilmot Clement**, Pelham, N. H., Harvard University Medical School, Boston, 1873, member of the Massachusetts Medical Society, aged 87, died, Nov 28, 1937

**Paul Wallace Bailey**, Akron, Ohio, Northwestern University Medical School, Chicago, 1923, aged 39, died, Dec 23, 1937, in a local hospital, of cirrhosis of the liver

**L. A. Welch**, Tylertown, Miss., Louisville (Ky.) Medical College, 1891, member of the state legislature, aged 68, died suddenly, Dec 12, 1937, of coronary thrombosis

**Stephen Chauncey Stone**, Salem, Ore., Willamette University Medical Department, Salem, 1875, also a druggist, aged 90, died, Dec 23, 1937, of bronchopneumonia

**John C. Tasche**, Sheboygan, Wis., Detroit College of Medicine, 1896, aged 73, died, Dec 19, 1937, in the Memorial Hospital, of lobar pneumonia

**Arthur Gerrish Allan**, Butte, Mont., University of Pennsylvania Department of Medicine, Philadelphia, 1878, aged 81, died in November 1937

**William Sampson Wallace**, Berkeley, Calif., Jefferson Medical College of Philadelphia, 1881, aged 81, died, Dec 25, 1937

**Albert F. Stephens**, St. Louis, Eclectic Medical Institute, Cincinnati, 1885, aged 77, died, Dec 1, 1937, of angina pectoris

**William H. Way**, Austin, Texas, Jefferson Medical College of Philadelphia, 1861, aged 97, died, Dec 16, 1937

**Frederick Winslow**, Boston, Harvard University Medical School, Boston, 1900, aged 63, died Nov 25, 1937

**Ida Belle Rulison**, Cincinnati, Woman's Medical College of Cincinnati, 1890, aged 83, died Dec 20, 1937

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### PAINFUL UTERINE CONTRACTIONS IN PREGNANCY

*To the Editor*—A woman, aged 33, now in the seventh month of her second pregnancy, complains of severe uterine pains accompanied by contractions. These are brought on by any sudden movement, such as getting up from bed quickly or rising quickly from a sitting to a standing posture or by any slight exertion such as walking on uneven ground or walking upstairs. The pains started about two months ago but are becoming more frequent and more disabling, occurring now three or four days a week and being relieved only after a day or two in bed after which they will be absent for five or six days but recur with the resumption of normal activity. As I have observed them, the pains are accompanied by hard uterine contractions lasting from forty to sixty seconds the more severe ones causing backache and bladder pressure and being identical with first stage labor pains. They recur variably from every ten minutes to one or two during the hour. On two occasions they have continued for a day at a time even with the patient at complete rest in bed. After a bout of these pains the baby is unusually active for about an hour. The patient feels well otherwise and would like to be able to go about her work without so much time out for rest. The blood pressure is 100 systolic 60 diastolic. Urinalysis gives negative results. The blood calcium is within normal limits. There was a mild anemia two months ago. The red blood count is 3,900,000 and hemoglobin 60 per cent which responded well to iron therapy by mouth. She has gained 12 pounds (5.4 kg.) since the beginning of this pregnancy. Her height is 5 feet 2 inches (157.5 cm.) her weight 136 pounds (62 kg.). Her abdomen does not seem distended or exceptionally large. Her first pregnancy occurred five years ago. She had similar pains in the last six weeks of that pregnancy but they were not nearly so disabling as those she is having now. Delivery was noninstrumental after prolonged labor (fifty hours) apparently due to uterine inertia. The baby a girl weighing 5 pounds 2 ounces (2,325 Gm.) was healthy. Can you suggest anything which could cause this apparently irritable condition of the uterus? There is no accompanying bleeding but when the pains are prolonged for several hours there is a slight mucoid discharge.

M. D. Manitoba

**ANSWER**—Painful Braxton Hicks contractions or false pains occasionally occur in multiparas. Rarely, however, are they of such severity that they seriously interfere with the patient's rest or activity. Other women in whom these uterine contractions were as disturbing as in this patient have been observed.

The underlying cause of such painful contractions is not known. They probably represent an increased irritability of the uterine musculature. If this is the case, progesterone, the hormone of the corpus luteum, should be effective in allaying both the uterine contractions and the pains. One can give a rabbit unit of progesterone intramuscularly once or twice daily for a number of days with possibly excellent results.

The usual treatment in the past has been rest in bed and sedatives. Opiates provide the best results. However, since this condition is likely to last for some time, barbiturates may be preferable. It is rarely justifiable to terminate the gestation because of this complication. However, there is probably no harm in such a procedure if it is done at or near term. At that time the best results are secured by a medical induction or perhaps the artificial rupture of the membranes if the cervix is effaced and the os sufficiently open to admit one or two fingers.

### NASAL SEPTUM OPERATION WITHOUT PACKING

*To the Editor*—May I request information on a nasal septum operation an account of which appeared in the literature six or seven years ago? I do not remember the precise nature of the procedure but the essential point is that postoperative handling eliminated the necessity for packing with gauze.

E. L. GUIDONE, M.D., Harding Mass.

**ANSWER**—In the *Archives of Otolaryngology* (13:732 [May] 1931) appeared a clinical note by Emanuel Roth entitled "A Method of Nasal Packing Following Submucous Resection of the Septum Which Allows Free Nasal Respiration." The method consists of inserting two pieces of smooth rubber tubing cut from a size 22 French rectal catheter and inserting one into each nasal fossa about 2 inches from the nostril. The rubber tubing rests on the floor of the nose and the nose is packed with petrolatum gauze above the tubing. This allows the patient to breathe through the nose.

If, in order to spare the patient the discomfort that follows mouth breathing one avoids packing following submucous resection, the danger of hemorrhage and hematoma is ever present. If one uses a method such as described one does not altogether

escape the discomfort incident to packing the nose. Normal nasal breathing is characterized by the moistening and warming of the air before it reaches the pharynx. Even in the method described the air goes through the tubes and then impinges on the nasopharynx without the benefit of passing over a normal nasal mucosa, and so to a greater or lesser extent the dry pharynx and discomfort attendant on mouth breathing is still present. There is therefore no perfect method for handling the septum operation postoperatively from the standpoint of comfort in breathing.

#### LEPTOTRICHOSIS OF EYE

*To the Editor*—A white woman aged 65 has a leptotrichosis conjunctivae associated with *Staphylococcus aureus* and albus infection. The condition is in both eyes it has been present for five years she states there is no involvement of the cornea. She has been treated by several competent ophthalmologists without lasting benefit. During these treatments she has no doubt received applications to the conjunctivae of most of the drugs usually found of benefit in chronic conjunctivitis. I am using a placebo until I can secure information regarding the treatment. The patient's general condition appears to be good. I will appreciate any suggestions.

M D, District of Columbia

*ANSWER*—If the patient has the form of leptotrichosis conjunctivae which was described by Verhoeff and which is usually known as Parinaud's conjunctivitis, it is unheard of that the condition should last five years and should involve both eyes. This condition has always been unilateral in reported cases and runs a course of from two to five months. If the condition referred to is leptotrichosis concretions of the lacrimal canaliculus, which often does involve both eyes, the treatment is enlargement of the canaliculi and removal of the concretions with a sharp spoon. A few cases of chronic catarrhal conjunctivitis due to leptotrichosis of the conjunctiva itself have been reported. These have been rare, however, and have usually responded to simple treatment of the type used in most cases of chronic conjunctivitis. Identification of the leptotrichosis and more information about the case would be helpful in suggesting appropriate treatment.

#### NIGROSIN STAIN IN MEASLES

*To the Editor*—Please describe the technique and observations in reference to the diagnosis of measles with the nigrosin stain.

B F Cook M D Rutland Vt

*ANSWER*—Jean Broadhurst and her associates have found in measles nigrosin staining bodies in ciliated and columnar cells and in globoid basal cells in smears from the nose and in globoid cells in smears from Koplik spots. The inclusion bodies are usually globular but may be irregular or elongated. They are found mainly in or on the nucleus of the tissue cells. They may be seen on the first day of the disease and are present to at least the twelfth day and are not present in persons who do not have measles or other virus infections. A 1 per cent solution of nigrosin in water is filtered, autoclaved and stored in corked bottles. Specimens are taken with dry or slightly moistened swabs. Swabs are washed with a small amount of sterile water and smears are made from both the washed swab and the wash water. Smears are fixed with heat flooded with stain for from twenty to forty minutes, carefully washed with water, drained dry and mounted in balsam.

#### STERILIZING SCRUB BRUSHES

*To the Editor*—I should like some information concerning the sterilizing of hand scrub brushes. I am using the bristle embedded in a wooden back. After a few sterilizings either by boiling or by autoclaving the bristles become soft and turn sideways. As these brushes are too expensive to replace often can you furnish me with any adequate method of sterilizing which will not impair the bristles so readily?

R N Delaware

*ANSWER*—The following method has been found to be satisfactory in sterilizing surgeons' hand scrub brushes.

1 Rinse thoroughly to remove all soap from bristles and cleanse the brush.

2 Shake off superfluous water and dry by rubbing on clean towel.

3 Place in metal or white enamel container without metal cover. (One of the supply houses markets a special container that holds six or more brushes and that is very convenient.)

4 Wrap container in double thickness muslin wrapper just as for dressings.

5 Autoclave for fifteen minutes at from 240 to 250 F in pure steam at 15 pounds pressure.

6 Shut off the steam but do not draw a vacuum. Let dry under normal atmospheric pressure. Vacuum drying is a major

cause of trouble with bristles. Placing brushes so that they will rest on the wooden back during and after autoclaving will also help preserve them. Some deterioration must be expected, particularly if the bristles are not of the best grade.

#### SCARLET FEVER ANTITOXIN

*To the Editor*—In what regard is streptococcus antitoxin held today as it relates to the treatment of scarlet fever? Do pediatricians generally feel that its use is of basic therapeutic value in early severe cases? Does its early use substantiate the belief that it tends to prevent complications? Would you want your child to have it?

JOHN T LELAND M D Hermon Minn

*ANSWER*—Scarlet fever streptococcus antitoxin is regarded as an efficient therapeutic agent for the treatment of scarlet fever. Many pediatricians favor its use if it is injected early. When given within three days of the appearance of the rash, the antitoxin seems to lessen the likelihood of complications. A decision to withhold scarlet fever antitoxin would not be justified on present day pediatric conclusions.

When first placed on the market, scarlet fever antitoxin often caused severe reactions. For this reason many physicians feared to use it. Now there is available a highly refined scarlet fever antitoxin which seldom produces unpleasant reactions. There should be no hesitancy about administering this preparation to one's own child.

#### VOCABULARY AND INTELLIGENCE IN CHILDHOOD

*To the Editor*—1 How many words are in the vocabulary of the average child of 1 year? of 18 months? 2 What is the highest recorded number of words at the age of 1 year and the age of 18 months? 3 Can a determination of the intelligence quotient be made on the basis of a child of 18 months having a vocabulary of 700 different words (no plurals or similar variations) plus the ability to identify the twenty six letters of the alphabet (printed capitals) and colors assuming that manual dexterity is also well developed? Small sentences are used freely. And what would this intelligence quotient be in the stated case? 4 How close is the correlation between intelligence and any one one two and all three of the following: walking, talking, teething?

EMIL ROTHSTEIN M D Brooklyn

*ANSWER*—1 Language studies have been made on such different types of children, by such different methods and with such varying standards that it is difficult to give a conclusive answer. However, several studies of presumably normal children indicate that the average child of 1 year has a vocabulary of three words and the average child of 18 months a vocabulary of about twenty words. A few authorities place the 18 month vocabulary as high as seventy words.

2 M M Nice in 1926 gave the highest number of words recorded at 1 year as twenty-four and the highest number at 18 months as 523.

3 These data indicate an unusually high intelligence, but to determine an intelligence quotient even more information is required. To obtain the intelligence quotient the child should be given a standard intelligence test such as the Minnesota preschool, the Merrill-Palmer, or the new Stanford-Binet test.

4 There is a definite relationship between intelligence and the age of first walking and talking. However, the correlation is not sufficiently high so that any one of these factors can be used as a measure of the others in any one child. There is evidence that mental retardation correlates positively with retarded dentition in the permanent teeth, but there is no evidence available on the relation of the first teething to intelligence.

#### BLEACHING HAIR

*To the Editor*—Please give me the name of a harmless bleaching agent for superfluous hair on the upper lip, face and chest—one that could be used about once a week without harm to the skin.

M D Missouri

*ANSWER*—Ordinary fresh solution of hydrogen peroxide of a good make is sufficient. The following directions for its use are after Herman Goodman's *Cosmetic Dermatology*, New York and London, McGraw-Hill Book Company, 1936, page 325. Wash well with soap and water and rinse thoroughly several times with clear water. Now draw a pledget of cotton wet with ammonia water (not the stronger ammonia, which is caustic) lightly over the hair to be bleached. This removes any grease that may be left and alkalizes the hair. Before this has time to dry, a pledget of cotton wet with hydrogen peroxide solution is passed over the hair in the same manner. Nascent oxygen is liberated which decolorizes the pigment in the hair. This treatment should not irritate any normal skin. It makes the hair dry and brittle. It may be repeated as desired. The preliminary washing is very important.

## CHROMIUM NEPHRITIS AND DETECTION IN URINE

To the Editor—Can chromium poisoning cause nephritis? Is there a test to detect chromium in the urine? A white man aged 36 whose work brings him into some contact with chromium oxide fumes, has no complaints except for a slight ulcer on the nasal septum. During a routine life insurance examination albumin 2 plus numerous blood cells positive for pus and hyaline casts were found. The past history is entirely negative physical examination is negative and no foci of infection are found. The blood pressure is 128 systolic 85 diastolic. Because he looks and seems to be in good health twenty-four hour specimens of urine on several separate days were analyzed and they all show albumin blood pus and casts. Am I correct in assuming that some form of nephritis exists? No further laboratory work has been done because I want to rule out the chromium angle first. M D New Jersey

ANSWER—In experimental work, chromates have been shown to produce in addition to local action fairly intense systemic injury, involving the respiratory, digestive and urinary tracts, particularly the renal tubules. The majority of investigators emphasize the peculiar and definite local action of chromates injury usually being limited to dermatitis "chrome holes" and inflammation and ulceration of mucous membranes with septal perforation constituting characteristic lesions. Ordinarily, chromium is fixed at the point of first contact with susceptible surfaces and hydrolysis does not readily take place. The consensus is that kidney lesions from chromium are doubtful, even though chromium may be found in the urine. In one instance a finding of 68 mg of chromium per liter of urine was reported, but this was associated with only a trace of albumin.

The quantitative determination of chromium in the urine constitutes a difficult procedure which cannot be carried out in the usual clinic or hospital laboratory. The most reliable method is that described in McNally's "Toxicology," which is so sensitive as to detect as little as 0.003 mg of chromium.

## SYPHILIS TEST FOR SMALL HOSPITAL

To the Editor—I am writing for information on a reliable precipitation test for syphilis for use in a hospital of ten beds and an office practice serving about 1500 people. The laboratory is small and there is no technician for laboratory duty only. M D Wyoming

ANSWER—Many small hospitals employ the Kahn test as the serologic method. Generally, a nurse who looks after the laboratory work carries out this test. To learn the technique of the Kahn test, as of any other serologic test, it is essential to have personal instruction by one who is expert in the particular method. Antigen for the Kahn test may be obtained from any of the biologic houses or from Dr Kahn's laboratory at the University of Michigan Hospital, Ann Arbor. The equipment for the Kahn test is supplied by any of the medical laboratory supply companies.

## SURGERY OR RADIUM IN EPITHELIOMA OF LIP

To the Editor—Which is the more generally accepted treatment for early epithelioma of the lip surgery or radium?

J P SNEAD M D Sperryville Va

ANSWER—In early epithelioma of the lip the results of surgical and of radiologic therapy are comparable as far as curability is concerned. The cosmetic results with radiation therapy are superior to those of surgery. The decision as to the form of therapy must depend largely on the availability to the patient either of a good surgeon or of a good radiologist.

## URINE IN RECTUM FOR ASTHMA

To the Editor—A patient has told me of the asthmatic child of a friend who lives in Germany. While the child is in the spasm the child's urine is injected into the rectum with immediate relief. Have you ever heard of this procedure?

JOSEPH C KLAUDER M D, Staten Island N Y

ANSWER—A search of the literature reveals no report of such a method of treatment. If the relief is bona fide, it would undoubtedly come under the heading of relief by nonspecific measures.

## SOLUTION OF POSTERIOR PITUITARY FOR HERPES

To the Editor—Will you be good enough to tell me where I can find data on the treatment of herpes with solution of posterior pituitary?

E W WILLETS M D Pittsburgh

ANSWER—Vandel (*Ugeskr f læger* 85 222, 1923) introduced the use of solution of posterior pituitary in the treatment of herpes zoster. An adequate report, by D M Sidlick, may be found in the *Archives of Dermatology and Syphilology* 22 91 (July) 1930.

## Medical Examinations and Licensure

## COMING EXAMINATIONS

## STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL March 19 page 921.

## NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination May 9 11 (limited to a few centers) June 20 22 and Sept 12 14. Ex Sec Mr Everett S Elwood 225 S 15th St, Philadelphia.

## SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country April 16. Oral examinations for Group A and B applicants will be held at San Francisco June 13 14. Sec Dr C Guy Lane 416 Marlboro St Boston.

AMERICAN BOARD OF INTERNAL MEDICINE Written examination will be held at various centers of the United States and Canada Oct 17. Final date for filing applications is Sept 1. Chairman Dr Walter L Biering 406 Sixth Ave Suite 1210 Des Moines Iowa.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates (Groups A and B) will be conducted in San Francisco June 13 14. Application for admission to Group A examinations must be on file before April 1. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13 Washington D C Oct 8 Oklahoma City Nov 15. All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination. Sec Dr John Green 3720 Washington Blvd St Louis Mo.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY Chicago June 10 11. Sec Dr Fremont A Chandler 6 N Michigan Ave, Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10 11. Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha.

AMERICAN BOARD OF PATHOLOGY Philadelphia May 5 6. Sec Dr F W Hartman Henry Ford Hospital Detroit.

AMERICAN BOARD OF PEDIATRICS New York City May 3 4 and San Francisco June 12. Sec Dr C A Aldrich 723 Elm St Winnetka Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY San Francisco June 11. Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C.

AMERICAN BOARD OF RADIOLOGY San Francisco June 10 12. Sec Dr Byrl R Kirklin 102 110 Second Ave S W Rochester Minn.

AMERICAN BOARD OF UROLOGY San Francisco June 11 13. All condensed case reports must be filed by April 1. Written examination will be held in various cities in the United States and Canada April 2. Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis.

## Connecticut November Examinations

Dr Thomas P Murdock, secretary, Connecticut Medical Examining Board, reports the written examination held at Hartford Nov 9-10, 1937. The examination covered 9 subjects and included 70 questions. An average of 75 per cent was required to pass. Thirty-four candidates were examined, 24 of whom passed and 10 failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Yale University School of Medicine	(1930)	76	83
Georgetown University School of Medicine	(1936)	75	76
Johns Hopkins Univ School of Medicine (1931)	87	4	80
University of Maryland School of Medicine and College of Physicians and Surgeons	(1936)		78
Boston University School of Medicine	(1933)		76
Tufts College Medical School (1935)	75	3	83
St Louis University School of Medicine	(1935)		76
Columbia University College of Physicians and Surgeons	(1936)		79
New York University University and Bellevue Hospital Medical College	(1934)		81
Jefferson Medical College of Philadelphia	(1936)		76
Temple University School of Medicine	(1936)		78
University of Vermont College of Medicine	(1937)		80
Medical College of Virginia	(1936)		75
Queen's University Faculty of Medicine	(1928)		75
University of Toronto Faculty of Medicine	(1930)		76
McGill University Faculty of Medicine	(1931)		83
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1935)		75
Osteopath			
School	FAILED	Year Grad	Per Cent
Tufts College Medical School	(1936)		71
Crighton University School of Medicine (1936)	73	4	72
Jefferson Medical College of Philadelphia	(1937)		74
Marquette University School of Medicine	(1937)		69
Ludwig Maximilians Universität Medizinische Fakultät München	(1924)		68
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest	(1930)		67
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1934)		71
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1936)		66
Osteopath			



Twenty-three physicians were successful in the oral examination held for endorsement applicants at Hartford, November 23. The following schools were represented

School	PASSED	Year	Endorsement
		Grad	of
Yale Univ. School of Medicine (1934) *	(1935) 2	(1935) 3	N B M Ex
Georgetown University School of Medicine		(1936)	N B M Ex
Harvard University Medical School (1931)		(1934) *	N B M Ex
Tufts College Medical School		(1935) *	N B M Ex
Columbia University College of Physicians and Surgeons (1931) *	(1932)	(1933) *	N B M Ex
Cornell University Medical College		(1927) *	N B M Ex
Long Island College Hospital		(1901)	New York
Long Island College of Medicine (1933)		(1934)	New York
Syracuse University College of Medicine		(1924) *	New York
University of Oregon Medical School		(1932) *	Oregon
Temple University School of Medicine		(1933)	New York
Woman's Medical College of Pennsylvania		(1907)	New Jersey
Vanderbilt University School of Medicine		(1936)	N B M Ex
McGill University Faculty of Medicine		(1930)	N B M Ex

\* License has not been issued  
† Verification of graduation in process  
‡ Licensed to practice surgery  
§ Examined in medicine and surgery

## Book Notices

**Ascaris. The Biologists Story of Life.** By Dr. Richard Goldschmidt. Cloth. Price \$3.25. Pp. 390 with 160 illustrations. New York: Prentice Hall, Inc. 1937.

It is a pleasure to read a book written by any one so well qualified in his field as the author of this attractive volume. When in addition the writer has a pronounced gift for writing and presents a great number of clear and attractive drawings to illustrate the text of the book, it is certain to be popular. Starting with an exceedingly simple discussion of adaptation to life, he refers to many simple animal forms. The following chapters discuss such problems as the form and color of animals and the purposes of skin and methods of protection of the body, including immunization. There is a minute discussion of the special senses. The author ends the book in the discussion of heredity, embryology and related topics with considerable detail. Throughout the entire book one notes that simple direct method with a vast amount of detail which can be presented only by a man who is familiar with his field. One misses, however, the application of all this information to questions relating to man. The informed reader may be somewhat distracted by literary references and certain side remarks which gives one the impression that the author is talking down to his reader. The first chapters could be understood by a child in grade school, but only a college student or one willing to use a dictionary could follow the later chapters, not because of words relating to the subject but because of the scholastic English of the writer. Many unfamiliar words are used without definition. Since the book is attractively produced and contains so many unusual and interesting facts, it will find many readers of all age groups.

**Practical Talks on Kidney Disease.** By Edward Weiss, M.D., Professor of Clinical Medicine, Temple University School of Medicine, Philadelphia. Cloth. Price \$3. Pp. 176 with 13 illustrations. Springfield, Ill.: C. C. Thomas, 1937.

Many books on nephritis have appeared in the last decade. This book differs from the former in that the contents present the opinion of the author without reference to disputations or disagreements and without a bibliography. It is at the same time practical, clear, concise and down to date, and it furnishes the desired information in an easily readable style. The subject matter is divided into seven relatively short chapters, on general considerations, disturbances of renal function, signs and symptoms of kidney disease, glomerulonephritis, nephrosis, pregnancy and kidney disease and nephrosclerosis. The important tests of renal function are described in a way that any one can grasp and they are properly evaluated. In line with the present trend, he does not recognize nephrosis as a clinical entity but as a syndrome appearing in the course of nephritis. No reference to the work of Goldblatt is mentioned in consideration of the etiology of hypertension. Ordinarily a 6 per cent solution of acacia in physiologic solution of sodium chloride is used for intravenous injection in glomerulonephritis with a low blood protein content and an inverted albumin globulin ratio. The

author mentions 30 per cent in 45 per cent saline solution. This is probably an error that crept in. There are some copies of interesting retinal pictures in the various forms of nephritis. The chapter on nephritis and pregnancy is particularly interesting because of the sane point of view and the stress laid on the importance of proper evaluation of the renal disease in the woman who is contemplating pregnancy. This little book is well written and can well be recommended to both the student and the practitioner.

**Précis de diagnostic chirurgical.** Publié sous la direction de Ch. Lenormant. I. Généralités. Par Ch. Lenormant, professeur de clinique chirurgicale à la Faculté de médecine de Paris et J. Sénèque, professeur agrégé à la Faculté de médecine de Paris. Tête et cou. Par P. Wilmoth, professeur agrégé à la Faculté de médecine de Paris. II. Thorax, sein, paroi abdominale, organes génitaux externes. Par Jean Patel, chirurgien des hôpitaux de Paris. III. Abdomen et pelvis. Par G. Menegaux, professeur agrégé à Faculté de médecine de Paris. IV. Membres. Par J. Sénèque, professeur agrégé à la Faculté de médecine de Paris. Cloth. Price 105 francs. 70 francs. 125 francs. 90 francs. Pp. 763 with 196 illustrations. 490 with 138 illustrations. 963 with 212 illustrations. 630 with 168 illustrations. Paris: Masson & Cie. 1937.

The author justly states in the preface that an exposition of methods of surgical diagnosis is considered as a difficult and audacious enterprise, since they became not only numerous but complex and intricate, to accomplish the task, he engaged four collaborators. The work consists of four volumes. The first offers a general description of exploratory procedures and deals with the special diagnosis of surgical diseases of the head and neck, the second volume concerns the diagnosis of diseases of the abdominal wall and external genital organs, the third discusses the diagnosis of surgical conditions of the abdomen and pelvis, while the fourth is devoted to the differential diagnosis of diseases of the extremities. The anatomic, pathologic-anatomic and pathogenic factors indispensable for a correct diagnosis receive due consideration, illustrations are numerous, well chosen and well reproduced. In spite of the size of the treatise, several important omissions have been noticed: gumma of the tonsils, carotid tumor, use of iodized oil in the diagnosis of carcinoma of the lungs, gastroscopy, terminal ileitis, granuloma inguinale and tear of the supraspinatus tendon. Volkmann's ischemic contracture, Dupuytren's contracture and Osgood Schlatter disease could not be located in the index. The chief drawbacks are the lack of conciseness and of simplicity in the presentation of the subject. The entire work consists of not less than 2,846 pages as the result of the verbosity of the authors and the overlapping of subjects in various chapters, with resulting frequent repetitions. Each volume has its own index, but the absence of a general index is a great disadvantage in a work of this type which, because of its size, can serve only as a reference book. Aimed to appeal primarily to the advanced student or graduate physician, the book fails of its objective because, although it contains an enormous wealth of material, the latter is not arranged in an easily accessible manner, the same subject being distributed over various chapters. In spite of this adverse criticism the authors may be commended for the painstaking way the book has been compiled and illustrated.

**Orthodiascopy. An Analysis of Over Seventeen Hundred Orthodiascopic Examinations.** By Chester M. Kurtz, M.D., F.A.C.P., Assistant Professor of Medicine, University of Wisconsin, Madison. Cloth. Price \$3.50. Pp. 247 with 67 illustrations. New York: Macmillan Company. 1937.

The orthodiascopic examination when properly done is as accurate as the teleroentgenogram and has the advantage that it permits the examiner to determine the pulsations of the heart border. It also permits the determination of the contour of the heart in other positions than the anteroposterior. This is ensured by the time consumed in making the examination. In this respect it is better than qualitative fluoroscopy. The author properly emphasizes the fact that the examination of the heart in this fashion should be as much at the disposal of the cardiologist and internist as the physical examination. A short historical outline is presented followed by a detailed description of the procedure for orthodiascopy used by the author. In the succeeding chapters the normal cardiac silhouette and the characteristic changes resulting from various types of cardiac disease are discussed. The author rightfully points out the limitations in value of the ratio of transverse diameter of the heart to that of the chest and instead follows the measure-



ments introduced by Bardeen and later developed by Hodges and Eyster of determining the surface area of the heart in relation to the age, stature and weight of the patient. The author's experience with children is discussed, and it is pointed out that more data need to be accumulated before the method is applicable to them. The author points out the merit of serial orthodiagrams. The diagnostic value of the size of the retrocardiac space is stressed. The monograph is a concise, clear presentation of the method recommended. Its only fault is that of any presentation by a protagonist in favor of a method advocated. More stress should have been placed on the errors and limitations of the procedure, especially in pointing out that records taken consecutively are not comparable unless extreme care is taken to ensure the same posture and the same position of the bony landmarks and diaphragm. However, this monograph can be highly recommended to the internist, the cardiologist and the general practitioner because of the clarity of the style and the excellence and profuseness of the illustrations. The thoughtful reader will be left with an urge to test out this procedure on his own material in order to enhance his diagnostic and therapeutic acumen.

**A Bibliography of the Works of Ambroise Paré. Premier Chirurgien & Conseiller du Roy.** By Janet Doe, Assistant Librarian of the New York Academy of Medicine. Cloth. Price \$5. Pp. 265 with 30 illustrations. Chicago: University of Chicago Press, 1937.

For this beautifully printed bibliography of Paré, Miss Doe has gone to the enormous labor of consulting 219 libraries and of recording all the Paré items they own. Her study of Dr. Harvey Cushing's Paré collection, probably the finest in the world, made available for her the notes with which Dr. Cushing has been annotating his books for many years. Several points interesting to the enthusiast are brought to light. Thus in Mrs. Ingram's catalogue of the late LeRoy Crummer's library, dated 1927, she recorded the "Anatomie universelle" as the rarest important medical book in the world and collected information about only four copies. Malgaigne never saw a copy. Miss Doe is now able to record eighteen copies. The *Cinq Livres* and the *Deux Livres* are rare volumes, but Miss Doe has traced fourteen of each. Experienced bibliophiles are chary of saying that such and such an item does not exist, so it is of interest that she regards the English edition of 1578 and the Latin *Opera* of 1561 as bibliographic ghosts. Malgaigne was the previous standard bibliographer of Paré. Miss Doe gives a sympathetic account of his life and scholastic attainments. Paré is one of those figures that have always attracted the affection of men of discrimination. It is a great distinction for American scholarship that so valuable and definite a bibliography should have been published here.

**Hunger, Appetit und Ernährung.** Von Prof. Dr. Sigismund Lauter, ärztl. Direktor des Gertrauden Krankenhauses, Berlin. Boards. Price 3.50 marks. Pp. 85. Leipzig: Georg Thieme, 1937.

This little monograph, dedicated to Friedrich von Müller, is a good analytic summary of our present knowledge of the mechanisms of the hunger and appetite "drives" and their modifications in disease, with special reference to the adequacy of mass dietaries and racial dietary habits. The point is made, and properly, in the concluding pages, that the inherited urges of hunger and appetite may be so modified by experience and social habits that they become inadequate biologic guides, in both the quality and the quantity of food consumption.

**Child Labor and the Nation's Health. Ratification of the Child Labor Amendment Would Decrease Tuberculosis, Increase the Nation's Health in General and Lead to Adoption of Medical Examination of Old and Young and the Creation of a Ministry of Public Health.** By S. Adolphus Knopf, M.D., Major Medical Officers Reserve Corps (Ret.). U.S.A. Paper. Price 50 cents. Pp. 32 with 7 illustrations. Boston: Christopher Publishing House, 1937.

This pamphlet is a plea for child labor and an effort to present the nation's health as a reason for the adoption of the amendment. Entirely aside from the merits of the question, this plea will hardly make much of an appeal to discriminating readers, though it might commend itself strongly to the unthinking. It is diffuse and poorly organized. It is full of digressions, such as the amount of space devoted to cigarette smoking by women, which seems somewhat beside the point. Much space is also devoted to venereal disease and the action of the Ameri-

can Medical Association relative to contraception. Just how these different subjects fit into the picture, the author does not adequately explain. He closes with a plea for compulsory medical examination "of every man, woman and child and provision for preventive and curative treatment," which is supposed to be consummated by "an efficient Committee on Maternal Health, the American Social Hygiene Association, the American Eugenic Society" and others, so that "we may have adequate medical care for all." The most notable characteristic of the pamphlet is its confusion of arrangement, if not of thought.

**A Manual of Practical Tropical Sanitation.** By J. Balfour Kirk, M.B., Ch.B., M.R.C.P., Director of the Medical and Health Department, Mauritius. Cloth. Price \$3. Pp. 300 with 46 illustrations. New York & Baltimore: William Wood & Company, 1937.

The author is a physician trained in tropical medicine and public health and has had practical experience in Mauritius with the difficulties that beset the health officer and impede his effective work in a tropical climate among a native population. The book is written primarily for the official use of sanitary inspectors to supplement oral and practical instruction. It is therefore somewhat free from technicalities. It should be useful to laymen, estate managers and holders, and especially to those in the tropics and in some particulars in other climates who find themselves removed from medical supervision or who for any reason must provide for sanitation and avoidance of communicable diseases.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts. Blood Pressure Tests as Practice of Medicine.**—The defendant, Max Plager, leased premises on the Boardwalk in Atlantic City, N. J., wherein he installed a sphygmomanometer which he represented would disclose the blood pressure of any person on whom it was used. At a charge of 10 cents, any passer-by, who so desired, could submit to the taking of his blood pressure. Plager would announce the result of the test and that result could be compared with the normal pressure as shown by a chart prominently displayed on the premises. Other than an occasional statement that the pressure disclosed was high or low, the defendant made no comment as to the effect of or treatment for the blood pressure as indicated and announced by him. Proceedings were instituted by the State Board of Medical Examiners of New Jersey against the defendant, charging him with a violation of the medical practice act. The trial judge entered a judgment of not guilty and the board brought certiorari to the supreme court of New Jersey.

The medical practice act of New Jersey, as far as is applicable to the present proceedings, provides:

Any person shall be regarded as practicing medicine and surgery, within the meaning of this act, who holds himself or herself out as being able to diagnose any human disease, pain, injury, deformity or physical condition or who shall either offer or undertake by any means or methods to diagnose any human disease, pain, injury, deformity or physical condition.

The question before the supreme court was whether or not Plager diagnosed a disease or a physical condition within the intentment of the medical practice act. If abnormal blood pressure is in itself a disease, then the taking of one's blood pressure and the announcement that it is high or low, normal or abnormal, is diagnosing a disease or physical condition prohibited under the act. After quoting from several textbooks on blood pressure the court concluded that abnormal blood pressure generally, is not a disease in itself and that the taking of blood pressure is, at the most, but another modern method of ascertaining a fact in aid of making a proper diagnosis. Thus the court said, it is almost invariably employed by careful physicians as one of the many steps in the process of making a

scientific diagnosis. The announcement by the defendant in the present case of the result of the systolic blood pressure—the diastolic blood pressure was not taken—was the mere statement of a fact, it was not, the court thought, a diagnosis of a disease or of a physical condition. If sound public policy demands that the defendant's conduct be prohibited, that physicians and surgeons only be permitted to take blood pressure, and that the taking of blood pressure should be decreed as the making of a diagnosis of a disease or physical condition, the court thought that the legislative and not the judicial branch of the government must so provide.

The judgment of not guilty was affirmed—*State Board of Medical Examiners of New Jersey v Plager (N J), 193 A 698*

**Malpractice Insurer's Liability When Policy Becomes Effective During Course of Treatment**—A physician treated Maxwell for a fractured femur from March 26 to Aug 7, 1932, when he was discharged from the case. Subsequently the patient, by his next of kin, recovered, in a malpractice suit, a judgment for \$6,000 against the physician *Marwell v Howell, 174 S E 553*, abstracted in THE JOURNAL, Feb 9, 1935, p 504, *Medicolegal Cases Abstracts of Court Decisions, 1931-1935, p 634*

Prior to the institution of the malpractice suit, the Aetna Life Insurance Company issued to the Monongalia County (W Va) Medical Society, of which the physician was a member, a group policy of malpractice insurance covering its members from and after July 23, 1932. The insurance company aided in defending the physician in the malpractice suit, even though it denied liability under the group policy, contending that whatever negligent treatment was involved in the case occurred prior to the date on which its policy became effective. The judgment against the physician could not be satisfied because of his bankruptcy, and the present suit was instituted by the patient against the insurance company. In the trial court the jury returned a verdict for the plaintiff, and the insurance company appealed to the U S circuit court of appeals, fourth circuit.

The trial court erred, said the circuit court of appeals, in rejecting the testimony of several physicians to the effect that if any malpractice occurred it took place prior to July 23, the effective date of the group policy. The insurance company assumed no liability whatsoever for any malpractice that occurred in the treatment prior to July 23. Since it was necessary for the jury to distinguish between the effects of the treatment before and after that date, the proffered testimony of the physicians was particularly relevant and should have been admitted. The case was remanded to the district court for a new trial—*Aetna Life Ins Co of Hartford Conn v Marwell, 89 F (2d) 988*

**Malpractice Liability of Physician for Negligence of Special Nurse**—A physician, in the opinion of the Springfield court of appeals, Missouri, is not liable for injuries caused to a patient by the negligence of a special nurse employed by the patient, even though the physician suggested that the nurse employed be selected. In the present case the patient was severely burned from an overheated solution of glucose administered by the nurse. The record showed that the nurse was a graduate nurse of good standing and reputation, experienced and trained in preparing and administering enemas and hypodermics and in injecting glucose solutions. There was no evidence that the physician was negligent in making his selection of the nurse. The injection of a glucose solution into the bowel, the court said, was routine and within the scope of the nurse's training and duty the same as taking the temperature, giving hypodermics or applying dressings to surgical wounds. The attending physician was not liable for the nurse's act of negligence in overheating the solution simply because he was the physician in charge of the patient and had authority to direct the nurse to render the service. He was not present when the solution was prepared, neither was he present when it was administered. Under the evidence, the court concluded, the plaintiff clearly failed to make out a case against the physician—*Louzader v James (Mo), 107 S W (2d) 976*

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Mobile Apr 19 21 Dr D L Cannon 519 Dexter Ave Montgomery Secretary
- American Association for Thoracic Surgery Atlanta Ga Apr 4 6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary
- American Association of Anatomists Pittsburgh Apr 14 16 Dr George W Corner 260 Crittenden Blvd Rochester N Y Secretary
- American Association of Genito Urinary Surgeons Atlantic City N J May 2 4 Dr Henry L Sanford 1621 Euclid Ave Cleveland Secretary
- American Association of Pathologists and Bacteriologists Atlantic City N J May 3 4 Dr Howard T Karsner 2085 Adelbert Road Cleveland Secretary
- American Association of the History of Medicine Atlantic City N J May 2 Dr E J G Beardsley 1919 Spruce St Philadelphia Secretary
- American Association on Mental Deficiency Richmond Va Apr 20 23 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary
- American Bronchoscopic Society Atlantic City N J Apr 30 Dr Lyman Richards 319 Longwood Ave Boston Secretary
- American College of Physicians New York Apr 4 8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary
- American Gastro-Enterological Association Atlantic City N J May 2 3 Dr Russell S Boles 1901 Walnut St Philadelphia Secretary
- American Laryngological Association Atlantic City N J May 2 4 Dr James A Babbitt 1912 Spruce St Philadelphia Secretary
- American Laryngological Rhinological and Otolological Society Atlantic City N J Apr 27 29 Dr C Stewart Nash 277 Alexander St Rochester N Y Secretary
- American Neurological Association Atlantic City N J May 2 6 Dr Henry A Riley 117 East 72d St New York Secretary
- American Orthopedic Association Atlantic City N J May 3 5 Dr Ralph K Ghormley 110 Second Ave SW Rochester Minn Secretary
- American Physiological Society Baltimore Mar 30 Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary
- American Society for Clinical Investigation Atlantic City N J May 2 Dr J M Hayman Jr 2065 Adelbert Road Cleveland Secretary
- American Society for Experimental Pathology Baltimore Mar 30 Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary
- American Society for Pharmacology and Experimental Therapeutics Baltimore Mar 30 Apr 2 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary
- American Society of Biological Chemists Baltimore Mar 30 Apr 2 Dr H A Matthi Chemistry Bldg State University of Iowa Iowa City Secretary
- American Surgical Association Atlantic City N J May 2 4 Dr Charles G Mixer 319 Longwood Ave Boston Secretary
- American Therapeutic Society New York Apr 1 2 Dr Oscar B Hunter 1835 Eye St NW Washington D C Secretary
- Arizona State Medical Association Tucson Apr 21 23 Dr D F Harbridge 15 East Monroe St Phoenix Secretary
- Arkansas Medical Society Texarkana Apr 18 20 Dr W R Brooksber 602 Garrison Ave Ft Smith Secretary
- Association of American Physicians Atlantic City N J May 3 5 Dr Hugh J Morgan Vanderbilt University Hospital Nashville Tenn Secretary
- California Medical Association Pasadena May 9 12 Dr F C Warnshuis 450 Sutter Street San Francisco Secretary
- Conference of State and Provincial Health Authorities of North America Washington D C Apr 9 11 Dr A J Chesley Minnesota State Office Bldg St Paul Secretary
- Congress of American Physicians and Surgeons Atlantic City N J May 3 4 Dr John T King Jr 1210 Eutaw Place Baltimore Secretary
- District of Columbia Medical Society of the Washington May 4 5 Dr C B Conklin 1718 M St NW Washington Secretary
- Federation of American Societies for Experimental Biology Baltimore March 30 April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
- Florida Medical Association Miami May 9 11 Dr Shaler Richardson 111 W Adams St Jacksonville Secretary
- Georgia Medical Association of Augusta Apr 26 29 Dr Edgar D Shanks 478 Peachtree St NE Atlanta Secretary
- Hawaii Territorial Medical Association Honolulu May 20 22 Dr Douglas B Bell Dillingham Bldg Honolulu Secretary
- Illinois State Medical Society Springfield May 17 19 Dr Harold M Camp Lahl Bldg Monmouth Secretary
- Iowa State Medical Society Des Moines May 11 13 Dr Robert L Parker 3310 Sixth Ave Des Moines Secretary
- Kansas Medical Society Wichita May 9 12 Mr C G Munns 112 West Sixth St Topeka Executive Secretary
- Louisiana State Medical Society New Orleans May 2 4 Dr P T Talbot 1430 Tulane Ave New Orleans Secretary
- Maryland Medical and Chirurgical Faculty of Baltimore Apr 26 27 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary
- Mississippi State Medical Association Jackson Apr 19 21 Dr T M Dye McWilliams Bldg Clarksdale Secretary
- Missouri State Medical Association Jefferson City May 2 4 Dr E J Goodwin 634 N Grand Blvd St Louis Secretary
- Nebraska State Medical Association Lincoln Apr 26-28 Dr R B Adams Center McKinley Bldg Lincoln Secretary
- New Hampshire Medical Society Manchester May 17 18 Dr Carleton R Metcalf 5 South State St Concord Secretary
- New Jersey Medical Society of Atlantic City May 17 19 Dr Alfred Stahl 55 Lincoln Park Newark Secretary
- New York Medical Society of the State of New York May 9 12 Dr Peter Irving 2 East 103d St New York Secretary
- North Carolina Medical Society of the State of Pinehurst May 2 4 Dr T W M Long Roanoke Rapids Secretary
- Ohio State Medical Association Columbus May 11 12 Mr C S Nelson 79 East State St Columbus Executive Secretary

Oklahoma State Medical Association Muskogee May 9 11 Dr L S Willour, Third and Seminole McAlester Secretary  
 Philippine Islands Medical Association Zamboanga City, Apr 19 22 Dr A S Fernando 817 Taft Ave Manila Secretary  
 Society for the Study of Asthma and Allied Conditions Atlantic City N J Apr 30 Dr W C Spain 116 East 53d St New York Secretary  
 South Carolina Medical Association Myrtle Beach May 17 19 Dr E A Hines Seneca Secretary  
 South Dakota State Medical Association Huron May 9 11 Dr Clarence C Sherwood 102½ Egan Ave S Madison Secretary  
 Tennessee State Medical Association Nashville Apr 12 14 Dr H H Shoulders 706 Church St Nashville Secretary  
 Texas State Medical Association of Galveston May 9 12 Dr Holman Taylor 1404 West El Paso St Fort Worth Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (\*) are abstracted below.

### Archives of Dermatology and Syphilology, Chicago 37 169 372 (Feb.) 1938

- Communicability of Leprosy and Application of Control Measures G W McCoy Washington D C—p 169  
 Leprosy Review of Some of Its Unusual Features C F Lehmann San Antonio Texas—p 175  
 \*Pemphigus Treatment with Sulfanilamide Preliminary Report M R Caro Chicago—p 196  
 New Method of Making Multiple Patch Tests J B Biederman Cincinnati—p 198  
 Lipoidosis Cutis et Mucosae (Lipoid Proteinosis of Urbach) Report of Disease in Two Sisters with Histologic and Histochemical Investigation in One Case F Wise and C R Rein New York—p 201  
 Bullous Dermatoses of Toxic Origin Report of Case Involving an Association with Choriocarcinoma J A Elliott Charlotte, N C—p 219  
 Cold Therapy in Dermatology New Freezing Gas H E Alderson San Francisco—p 234  
 Zosteriform Leukemia Cutis R E Barney Cleveland—p 238  
 Quinine Bisulfate as Desensitizing Agent in Treatment of Lupus Erythematosus A M Davidson and A R Birt Winnipeg Manit—p 247  
 Arthralgic Fever as an Adjunct in Treatment of Neurosyphilis N N Epstein San Francisco—p 254  
 Deciduous Skin P E Bechet New York—p 267  
 Syphilization Episode in Evolution of Syphilology A W Stillians Chicago—p 272  
 \*Superficial Intra Oral Use of Roentgen Rays Report of Use of Chaoul Tube L Hollander and J M Shelton Pittsburgh—p 279  
 Naevus Epitheliomato-Cylindromatosus G W Binkley, Cleveland—p 289  
 Melanoma Caused by Indelible Pencil H Sharlit New York—p 301

**Sulfanilamide in Treatment of Pemphigus**—Caro reports two cases of pemphigus in which sulfanilamide was administered. In the first case treatment consisted of 0.3 Gm of sulfanilamide, orally, four times a day. While the response in this case has not been spectacular, there has been rapid epithelization of eroded lesions. The patient's condition after treatment for one month is considerably improved. The other patient received 0.6 Gm of sulfanilamide by mouth, six times a day, each dose being followed by 15 grains (1 Gm) of sodium bicarbonate. Applications were made twice daily of a jelly containing 5 per cent tannic acid. On the second day under observation the patient's temperature rose to 102 F. The dose of the drug was reduced to 10 grains (0.6 Gm) five times a day. On the fourth day the temperature returned to normal and the patient felt stronger and more alert mentally. No new lesions had appeared, and the large denuded areas were showing epithelization. The dose of the drug was reduced to 5 grains (0.3 Gm) five times a day. At the end of one week no new lesions had appeared. Most of the eroded areas had healed completely and the large crusted lesions were healing rapidly. Because the prognosis in pemphigus has been hopeless, the author reports his results so that the treatment may be tested more extensively.

**Superficial Intra-Oral Use of Roentgen Rays**—Hollander and Shelton call attention to the use of intracavitary irradiation in intra-oral carcinoma and other recalcitrant lesions

of the oral cavity. The apparatus is a simple constant potential generator, using a Greinacher circuit, which has a maximal output of 60 kilovolts and 4 milliamperes. It is housed in a cabinet, the top of which contains the control switches and various meters for tuning, voltage and milliamperage. The tube is "shock proof." The radiation emanates from the distal end of a grounded metal tube, the x-rays emerge through a target of nickel and a water-cooling jacket which surrounds the anode. The amount of filtration is approximately that of 0.2 mm of nickel. In the ordinary case no special preparation is needed. The area to be irradiated is well exposed, and the applicator which fits it best is selected, placed on the tube and approximated to the lesion. If the lesion is tender it may be necessary to cocainize it with a 2 to 10 per cent solution by topical application. Chaoul and Morison use 400 roentgens daily per field for a maximum of from 6,000 to 9,000 roentgens. The authors have been using from 540 to 550 roentgens per field daily, treating as many fields as were necessary to cover the lesion. Their maximal dose varied from 10,000 to 40,000 roentgens. The usual course consisted of twenty consecutive daily doses of 540 roentgens. Mild erythema appears on the mucous membrane about the fifth day. As the treatments are continued, the severity of the erythema increases, the border becomes especially red, showing the outline of the applicator, and continues to become more pronounced until the end of the course, the center becomes covered with a yellowish necrotic film, which persists for from two to four weeks after the usual twentieth treatment has been given. Fourteen patients with carcinoma of the tongue were treated in four the local lesion disappeared entirely, in six it improved markedly, in one it was unimproved and three patients died. Of fourteen patients with carcinoma of the buccal mucous membrane treated, the local lesion disappeared entirely in six, was improved in five, was unimproved in two and one patient died. The local lesions disappeared in five patients with carcinoma of the pharyngeal wall and tonsils, as did the local lesions in three patients with carcinoma of the hard and soft palate. The local lesion disappeared in two patients with carcinoma of the alveolar ridge. Of the four patients with intra-oral sarcoma treated two improved, one was unimproved and one died. Four patients with intracavitary (but extra oral) carcinoma were treated. Three patients were improved and one was unimproved. The lesion disappeared in each of the five patients with nonmalignant intra-oral lesions that were recalcitrant to other forms of therapy.

### Journal of Lab and Clinical Medicine, St Louis 23 329 440 (Jan.) 1938

- Adrenal Cortex Extract Consideration of Its Use in Various Types of Adrenal Insufficiency and Related Conditions E Steinfield L N Ettelson and W A Hodes Philadelphia—p 329  
 Studies on Yeastlike Fungi Isolated from Pulmonary Disease (Broncho monias) T W Keiper Prescott Ariz—p 343  
 Coronary Disease in Diabetes Mellitus A M Lefkowitz New York—p 354  
 Treatment of Nutritional Anemia in Rats with Meat L K Campbell Chicago—p 358  
 Effect of High Protein Diets on Kidneys of Rats L K Campbell Chicago—p 361  
 Utilization of Calcium by Rats L K Campbell Chicago—p 362  
 Normal Glucose Tolerance Tests L A Watson Minneapolis—p 364  
 \*Hyperproteinemia in Multiple Myeloma A E Feller and W M Fowler Iowa City—p 369  
 Unusual Bacillus from Case of Bacterial Endocarditis G Freeman Chicago—p 379  
 Effect of Salts of Citric Acid on Serum Calcium in Albino Rat R S Leadingham and Rosaltha Hagan Sanders Atlanta Ga—p 382  
 \*On et and Course of Epidemic Meningitis as Related to Fluctuations in Temperature and Barometric Pressure G H Gowen Champaign, Ill—p 385

**Hyperproteinemia in Multiple Myeloma**—Feller and Fowler carried out blood protein studies on ten patients with multiple myeloma. Hyperproteinemia (total protein more than 9 per cent) occurred in three. In three additional cases the total protein was more than 8 per cent but these values must be considered within the upper limits of normal. In the cases in which there was a distinct hyperproteinemia the albumin fraction was either normal or slightly below and the increase in the total protein was due chiefly to globulin. The fibrinogen was increased in three cases but was approximately normal in

the others In all but the first three cases there was an alteration in the normal albumin-globulin ratio, with actual inversion of the ratio in four instances Examination of the urine revealed Bence Jones protein in five cases Reports of fifty-two cases are collected from the literature It appears that hyperproteinemia and hyperglobulinemia are virtually limited to multiple myeloma and therefore may be useful in the differential diagnosis of multiple lesions involving the skeletal system Hypercalcemia together with a normal or slightly increased content of inorganic serum phosphorus is frequently found in multiple myeloma but may occur with other lesions of the bone

**Relation of Epidemic Meningitis to Barometric Pressure**—Gowen made a daily study of weather conditions and correlated his observations with the incidence of epidemic meningitis in Sangamon County, Ill, during 1935 In studying the possible relation of meteorological alterations to tissue invasion and localization of the meningococcus, the data for analysis were obtained from the epidemiologic cards available in the Division of Communicable Diseases of the Illinois Department of Public Health The study confirms the evidence presented by Petersen that there is a significance of the passage of atmospheric fronts for the penetration of the meningococcus It is probable that bacterial penetration of tissue is of common occurrence Unless the organism concerned is of high virulence or the local resistance is low, there probably results nothing more than reticulo endothelial fixation of the invader with subsequent destruction In some instances in which the organism so fixed is not destroyed the occurrence of a sudden pressor episode, meteorological or otherwise may cause the mobilization of the fixed bacteria and their being thrown into the circulation The effect of the pressor episode correlates with the three stages (localization in the upper respiratory passages invasion of the blood stream and metastatic localization) in the development of epidemic meningitis

## Journal of Nutrition, Philadelphia

15 1102 (Jan) 1938

- Iodine Deficiency in Commonly Used Stock Diet C B Freudenberg and F W Clausen Salt Lake City—p 1
- Vitamin G and Synthetic Riboflavin O A Bessey Boston—p 11
- Effect of Diets Containing Fats of Various Degrees of Unsaturation on Serum Lipids in Rats A E Hansen and W R Brown Minneapolis—p 17
- Basal Metabolism of Oklahoma Men and Children Olga Nalbandov, G Heller Evelyn Krause and Daisy I Purdy Stillwater Okla—p 23
- Vitamin B Deficiencies as Affected by Dietary Carbohydrate Agnes Fay Morgan Bessie B Cook and Helen G Davison Berkeley Calif—p 27
- Etiology of Sebaceous Gland Atrophy in Rat in Avitaminosis Susan Gower Smith Durham N C—p 45
- Riboflavin and Further Growth Essential in Tissues Quantitative Distribution and Influence of Food E V Carlsson and H C Sherman New York—p 57
- Calcium Deficiency and Intestinal Stasis Elizabeth Chant Robertson Toronto—p 67
- Body Composition as Factor Governing Basal Heat Production and Endogenous Nitrogen Excretion U S Aslworth and G R Cowgill New Haven Conn—p 73
- Arrest of Nutritional Cataract by Use of Riboflavin P L Day W J Darby and K W Cosgrove Little Rock Ark—p 83
- Influence of Sex on Iron Utilization in Rats Mary Swartz Rose and Helen Jackson Hubbell New York—p 91

**Arrest of Nutritional Cataract by Use of Riboflavin**—Day and his associates gave young albino rats a diet deficient in flavin and examined their eyes at frequent intervals with the ophthalmoscope Of sixteen control animals receiving the deficient diet without supplement thirteen developed cataract at an average time of fifty-two days The cataract proceeded to maturity in twelve of these rats, at an average time of sixty-seven days The average survival was seventy-four days When early cataractous changes were evident, twenty-five rats were given intramuscular injections of riboflavin in doses of 120 micrograms twice a week The animals rapidly increased in weight new hair appeared on those rats with alopecia and keratitis cleared up slowly In eleven of these rats cataract was arrested in both eyes In each of six other rats the cataract proceeded to maturity in one eye but its progress was definitely arrested in the other eye The cataract proceeded to maturity in both eyes of two rats Six rats were found to have clear lenses in both eyes after the keratitis cleared up It is thus

apparent that the progress of cataract development was arrested by riboflavin administration in seventeen of nineteen animals exhibiting cataract These data furnish additional evidence that flavin is the cataract-preventive vitamin

## Kansas Medical Society Journal, Topeka

39 144 (Jan) 1938

- Effects of Benzedrine Sulfate Solution on Cycloplegia Preliminary Report L S Powell Lawrence and M E Hyde, Osawatonic—p 1
- Malignant Hypertension M Snyder Salina—p 4
- Modern Drug Therapy R M Isenberger Kansas City—p 8
- Uncontrollable Hemorrhage from Benign Prostatic Enlargement Report of Case W M Mills and O R Clark Topeka—p 12
- Pure Food and Drug Act E H Rees Emporia—p 13
- Fractures of Lower Margin of Orbit Reduction and Visualization by X Ray A C Eitzen Hillsboro—p 15

## Medical Annals of District of Columbia, Washington

7 132 (Jan) 1938

- Serum Antitoxin and Drugs in Treatment of Meningococcal Meningitis Sara E Branham Washington—p 1
- Certain Phases of the Pharmacologic Properties of Sulfanilamide E K Marshall Jr Baltimore—p 5
- Use of Sulfanilamide in Genito-Urinary Surgery Clinical Observations and Results F A Reuter Washington—p 8
- Morbid Anatomy of Bundle Branch Block Review of Literature Report of Sixteen Cases with Necropsy Examinations and Report of Six Cases with Detailed Histologic Study of Conduction System W M Yater Washington—p 10
- Treatment of Gonorrheal Vulvovaginitis with Corbus Ferry Filtrate Results in Thirty Six Cases D H Kushner Washington—p 18
- Facts and Fallacies of Hearing Tests W A Wells Washington—p 20

## Radiology, Syracuse, N Y

30 1146 (Jan) 1938

- Rollin Howard Stevens Anniversary Chronicle of His Useful Life P Brown Boston—p 1
- Role of Radiology in Medicine Gosta Forssell, Stockholm Sweden—p 12
- Contribution to Pathology and Clinical Picture of Reticulum Cell Sarcoma L Edling Lund Sweden—p 19
- Basic Principles for Successful Roentgen Therapy of Carcinoma H Wintz Erlangen Germany transcription by H A Jarre Detroit—p 35
- \*Giant Cell Tumors of the Spine Reports of Three Cases G E Richards and A C Singleton Toronto—p 43
- Trend in Radiotherapy of Cancer F C Wood New York—p 52
- Method in Radiotherapy A U Desjardins Rochester Minn—p 57
- Studies on the Problem of Mitogenetic Radiation O Glasser and H Barth Cleveland—p 62
- X Ray Study in Relation to Mandibular Joint Syndrome E C Ernst and J B Costen St Louis—p 68
- Pathologic Reactions Within Anatomic Unit of Lung Their Roentgen Portrayal Classification and Diagnosis W W Wasson Denver—p 76
- \*Dermatoroentgen Therapy Should the Common Dermatoses Be Treated with Filtered or Unfiltered Rays? C K Hasley Detroit—p 84
- Skin Reactions Caused by 1000 Kilovolt and 200 Kilovolt Radiations R S Stone San Francisco—p 88
- Tumors Involving the Skeleton H A Jarre Detroit—p 94
- Temporal Bone Studies E M Shebesta Detroit—p 110
- Congenital Bone Dysplasia S Ford Detroit—p 117
- Relation of Roentgen Therapy to Treatment of Fibrosarcoma H P Doub Detroit—p 122

**Giant Cell Tumors of the Spine**—The question of malignant variants of giant cell tumor of bone has been widely discussed and pathologists are divided in opinion in this regard Richards and Singleton point out that, theoretically, malignant giant cell tumor might occur as a primary tumor malignant from its inception or as a metaplasia from a simple benign giant cell tumor Geschickter and Copeland refute this but Ewing and Stone and others concur in this opinion, so that, for purposes of treatment, malignant tumors of this type do occur For practical purposes, whether they are microscopically malignant giant cell tumors or osteogenic sarcomas is of less moment as the response to treatment and the prognosis remain the same In many cases there are unusual features in the clinical history the location of the lesion or the age of the patient to mark them from the onset as unusual A careful clinical history, taken in conjunction with a thorough and competent X-ray investigation, will differentiate benign from malignant tumors of the bone in at least 80 per cent of cases The taking of biopsies in such cases has been opposed by a number of pathologists because of the dangers of infection and the feeling that dividing the periosteum and cortical shell leads to earlier local

extension and generalized dissemination of the disease. Aspiration biopsy, as evolved by Martin and Ellis, probably reduces the dangers of biopsy, both real and theoretical, to a minimum. This method should prove to be satisfactory in giant cell tumors in which the cortical shell is thin. In tumors of the spine in which surgical excision is impossible, the practical value of biopsies is much less as conservative methods of treatment must be employed, regardless of the type of tumor present. The treatment of giant cell tumor of bone has shown progressive improvement with changing conceptions of the pathologic changes of this lesion. Since Pfahler in 1906 first treated a case of benign giant cell tumor of bone by x-rays, radiation therapy has been slowly gaining ground and has been given great impetus by the work of Herendeen, Pfahler and Parry, Pearce and others. The response of these tumors is usually slow and is frequently preceded by a stage of lysis and apparent extension of the disease, to be followed by bone regeneration and repair. While controversy may continue as to the relative merits of surgical and radiation treatment of benign giant cell tumors of the long bones, there can be little question that radiation must be the method of choice when the disease affects the spine.

**Dermatoroentgen Therapy**—Hasley contends that unfiltered rays are being used too extensively in the treatment of common dermatoses. He advances three major reasons to support the contention that filtered rays are indicated in preference to the unfiltered ones. 1. Dermatologists were rather reluctant to adopt the Coutard method of treatment for malignant conditions of the skin, as they were interested in cutaneous recovery and feared that permanent postradiation sequelae might be extremely distressing. But now the Coutard method has been used long enough so that an effective volume of data has been collected on cutaneous recovery and repair. The epidermolysis which follows the Coutard protracted fractionated treatment produces from a partial to a complete destruction of the epidermal layers of the skin, leaving a dermal layer with its vascular and connective tissue elements relatively intact. Epidermal regeneration occurs through the growth of the basal layer at the edge of the treated areas and by islands of epithelium which remain in the hair follicles. A soft, pliable skin results. The cutaneous changes show little or no tendency to produce hard indurated fibrous tissue and, on recovery, relatively little change is noted in the vascular system of the skin. The fact that there is better cutaneous recovery following the Coutard technic than there is following the divided erythema or suberythema doses without filters forms one of the strong arguments for the use of filters. By this method a homogeneous or a monochromatic type of ray may be developed and used. 2. The changes effected in inflammatory tissue by filtered x-rays are another indication for the use of filtered radiation in treating the common dermatoses. The experiments of many roentgenologists indicate that small fractional doses given at short intervals are more effective than larger doses at longer intervals. The x-ray effect is due, in part at least, to the roentgen susceptibility of the lymphocytes and the leukocytes. Only a small amount of irradiation is needed to produce a destruction of the lymphocytes and in all probability an antibody is liberated on its destruction. Filtered doses permit repetition, if necessary, whereas the use of the unfiltered radion is limited. 3. The different radiations in like quantities and with like conditions produced different or unlike roentgen biologic effects. Consequently, it is concluded that a differential action was due to the quality of radiation and that a selectivity of radiation does exist. The differential action cannot be neglected in considering the practical utility in radiation therapy. Unfiltered rays are being employed too extensively, as the selectivity of the ray is increased by using a higher kilovoltage and more filters. The trend in the treatment of infections as given by the roentgenologist is in the direction of greater filtration and higher kilovoltage. In certain dermatoses the pathologic changes are extremely superficial, being confined largely to the upper layers of the corium and to the epidermis. Filtered x-rays do penetrate beyond the cutaneous pathologic changes, and one should not overlook the fact that the benefits of radiation therapy are both local and constitutional. It is better to err on the side of filtered radiation than to err on the side of overdosing with unfiltered rays.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

1 105 156 (Jan 15) 1938

- Lower Abdominal Pains of Cervical Origin Their Genesis and Treatment J Young—p 105  
Cultural Methods in Bacteriologic Diagnosis of Tuberculosis C A Green—p 111  
Treatment of Streptococcal Empyema with Intrapleural Sulfanilamide Experimental Study in Rabbits W F Nicholson—p 115  
Primary Carcinomas of Stomach and Sigmoid Colon Occurring Simultaneously R Maingot—p 118  
Epidemic Dropsy Note J V Landor and C D Williams—p 119  
Schick Relapse After Diphtheria T Piggott—p 120

## Glasgow Medical Journal

11 152 (Jan) 1938

- Survey of Virus Infections C E van Rooyen and A J Rhodes—p 1

## Journal of Pathology and Bacteriology, Edinburgh

46 1 220 (Jan) 1938

- Rugose Variant of Vibrios P B White—p 1  
Canine Prostate in Relation to Normal and Abnormal Testicular Changes S Zuckerman and T McKeown—p 7  
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\*Use of Saponin in Blood Culture Mediums with Especial Reference to Blood Cultures in Subacute Bacterial Endocarditis S D Elliott—p 121  
Gross Anatomy of Parathyroid Glands J R Gilmour—p 133  
Experimental Study of Pneumonia Following Aspiration of Oily Substances Lipoid Cell Pneumonia J L H Paterson—p 151  
Infection of Mice with Brucella Abortus of Bovine Origin N J Seorge—p 165  
Starch Fermenting Strains of Corynebacterium Diphtheriae in Newcastle on Tyne Serologic and Clinical Investigation R D Stuart—p 173  
Modification of Wilson and Blair's Bismuth Medium Suitable for Both Typhoid and Paratyphoid Bacilli F Tabet—p 181

**Pneumococcus Polysaccharide in Lobar Pneumonia**—Cruickshank points out that the specific polysaccharides of types I, II and III pneumococci are excreted in the urine of the majority of patients with lobar pneumonia due to these three types and may be demonstrated by a precipitation reaction. This urinary precipitation test has only a limited value as a method for the early serologic typing of lobar pneumonia, as the first specimen of urine examined was positive in only one fifth of the type I and one half of the type II infections. The detection of the polysaccharide in the urine early in the infection has, however, a grave prognostic significance, since the mortality in such patients was around 40 per cent, whereas less than 2 per cent died whose urinary specimens were persistently negative. The pneumococcus specific substance continues to be excreted in the urine during the patient's convalescence and in explanation of this phenomenon it is suggested that the polysaccharide as an antigen is gradually dissociated from the antibody and slowly excreted by the kidneys.

**Use of Saponin in Blood Culture Mediums**—During the investigation of a large series of blood cultures from patients immediately after the extraction of teeth it became apparent to Elliott that the culture technic employed gave less consistent results than might have been expected from the nature of the material investigated. The method used was a modification of that suggested by Wright. In searching for possible factors to account for this failure, attention was directed toward the cellular constituents of the blood culture medium. It was decided to compare with the original culture technic a method

in which the cellular constituents of the blood were lysed by means of saponin. Concentrations of 0.033 per cent of saponin, 0.17 per cent of sodium citrate and 16.7 per cent of blood were used. Most of the experiments were done with one strain of *Streptococcus viridans*. The risk of phagocytosis occurring in blood cultures is avoided by lysing the blood cells. The nature of the diluent is of importance in determining the growth of organisms, sodium citrate broth being superior to distilled water in this respect. Saponin in a concentration of 0.033 per cent produces rapid lysis of both red and white cells in a citrate blood broth mixture containing 16 per cent of blood and 0.17 per cent of sodium citrate, lower concentrations of blood require less saponin to produce the same effect. Saponin has an additional advantage as a lytic agent in that it may be incorporated in the broth to be used as a diluent before autoclaving. Using whole blood and saponin-lysed blood in parallel, streptococci were recovered in twenty-seven whole blood samples and thirty-eight lysed blood samples out of a total of thirty-nine positive blood cultures from sixty-five patients following dental extractions. In two cases of subacute bacterial endocarditis a *Streptococcus viridans* grew in the saponin-lysed blood but failed to grow in the whole blood samples. In the third case a *Streptococcus viridans* was recovered which grew earlier in lysed than in whole blood, while in the fourth case, in which a *Streptococcus faecalis* was isolated, no advantage was gained by the use of saponin.

### Medical Journal of Australia, Sydney

1 146 (Jan 1) 1938

\*Asthma in Children D L Barlow—p 4

Incisional Hernia A E Coates—p 7

Anterior Pituitary Gland and Carbohydrate Metabolism Charlotte M Anderson—p 11

**Asthma in Children**—Barlow declares that the early attacks of asthma in children are not infrequently thought to be due to bronchitis. Examination of the blood and of nasal smears for eosinophilia will, as a rule, establish the nature of the trouble. Heredity is important from the point of view of etiology, but allergic manifestations are very common. The degree of susceptibility is an inherited characteristic. Actual sensitiveness to particular proteins is not commonly inherited. Twins may both become sensitized, but the allergens may be different. Environment has been rather underestimated as a factor in determining sensitization. In childhood the patient will often prove to be sensitive to food as well as to inhalant proteins, but only rarely are foods the main allergic factors. If the public were educated to realize that not only asthma but also the very prevalent so called nasal catarrh are largely caused by atmospheric "dusts," a reduction of the chief offending articles would occur. Special attention should be given to mattresses and pillows, but padded quilts, cushions and upholstered articles of furniture all contribute to the atmospheric pollution unless special impervious fabrics are used for coverings. Breathing exercises and the inhalation of epinephrine hydrochloride are two items of general treatment. Breathing exercises are lately used more widely. The inhalation of epinephrine hydrochloride spray from an atomizer employing a concentrated solution (such as 1:100 or 1:50) is most valuable in the relief of attacks, but it is important for the medical adviser to inspect the instrument used, to make sure that the spray it gives out is both fine enough and of sufficient volume. The elimination of allergens to which the patient responds should be thoroughly carried out as far as it is practicable. Desensitization is usually necessary, for completely allergen-free conditions are not often obtainable. In some cases the elimination of a septic focus is required. If this proves to be the case, desensitization with this as well as with inhalant allergens should be undertaken. In a few children, vaccine therapy is needed to clear up an associated chronic bronchitis. The prognosis of asthma in children can be said to be quite good, provided the management is satisfactory. Failure to obtain results from desensitization usually means incomplete diagnosis, inefficient therapy or unsuitable general management. Exposure to ultraviolet radiation is a useful supplementary method of treatment in localities in which sunlight is scarce. Nonspecific protein therapy is capable of giving considerable benefit in a limited number of cases. Senior medical students should have work in an allergy clinic.

### Bull de la Soc Franç de Dermat. et de Syph, Paris

Dec 1937 (No 9) Pp 1979-2237 Partial Index

Treatment of White Spot Disease by Injections of Bismuth M A Szary—p 1981

Erythema Multiforme and Medullogram H Gougerot B Dreyfus and A Varay—p 2036

Division of Principal Types of Angiomas M A Touraine—p 2054

Three Observations of Electrogalvanic Leukoplakia One of Them with Cancer A Touraine and A Baudouin—p 2066

Agranulocytosis After Use of Para-Amino-Phenyl Sulfamide in Antigonorrheal Treatment A. Touraine, P Durel and A Baudouin—p 2072

\*New Method for Rapid Serodiagnosis of Syphilis Reaction of Ide R Demanche and Mlle Segal—p 2101

**New Method for Rapid Serodiagnosis of Syphilis**  
**Reaction of Ide**—Demanche and Segal direct attention to a new seroreaction for syphilis which was devised by the Ides of Tokyo, Japan. It is a simple method which can be used by the practitioner himself in a few minutes. Only a single drop of blood, which can be withdrawn from the finger tip or the ear lobe, is required for it. The technic used by the authors is essentially the same as that described by the Ides themselves in the *Klinische Wochenschrift* (15 973 [July 4] 1936, abstr. THE JOURNAL, Sept 26, 1936, p 1088) and in the *Journal of Laboratory and Clinical Medicine* (21 1190 [Aug] 1936). Another abstract on this reaction, which was published in THE JOURNAL Jan 30, 1937, page 428, was from a report by Manuel Quisumbing in the *Journal of the Philippine Islands Medical Association* (16 609 [Oct] 1936). The latter two publications give colored illustrations of the appearance of the slides in positive and negative reactions. Demanche and Segal state that the method can be used not only on a drop of blood but on blood serum, on cerebrospinal fluid and on vesicular exudates. They employed Ide's test on 295 subjects, 226 of whom had treated or untreated syphilis in different stages, sixty-one had no signs of syphilis and in eight the diagnosis was doubtful. They compared the results obtained with Ide's test with those of the reactions of Wassermann, Kahn and Meinicke (clarification). A tabular report indicates the outcome of these comparisons. On the basis of their observations the authors reach the conclusion that Ide's test is an original method which is tempting by its simplicity and rapidity. However, it is less sensitive than the reactions of Wassermann, Kahn or Meinicke and it is especially less precise, because of the difficulty of reading it, the latter difficulty explains the high number of doubtful results. Ide's test has the advantage that it furnishes an immediate indication, but this indication must always be controlled by the more exact classic methods for the serodiagnosis of syphilis.

### Journal de Medecine de Lyon

19 71 104 (Feb 5) 1938

\*Radiculomedullary Compressions in Malignant Granulomatosis J Froment P Croizat and R Masson—p 71

Tuberculous Meningitis in Course of Primary Infection in Adults J Froment and J Brun—p 89

**Radiculomedullary Compression in Malignant Granulomatosis**—Froment and his associates point out that, in the course of the development of malignant granulomatosis, radiculomedullary compressions without being frequent are far from being exceptional. It can be a question of compression by destruction of the vertebral body or of invasion of the epidural space through the intervertebral foramina or finally, in exceptional cases, of invasion of the spinal cord. The compression alone, in three fourths of the cases, reaches the spinal cord at the level of the cervical and dorsal spine. The impairment of the cauda equina appears, on the other hand, the characteristic of multiple compressions with foci at different levels. These occur in one fourth of the cases. The radiculomedullary compressions by malignant granulomatosis present the characteristics of all medullary compressions but evolve with extreme rapidity. They develop as rapidly as those caused by Pott's abscess or by spinal cancers, if not even more rapidly. What seems to characterize them especially, when the other signs of malignant granulomatosis do not yet draw attention, is besides the cervical adenopathy the habitual coexistence of a voluminous mediastinal adenopathy, which is revealed by thoracic roentgenography. Biopsy always gives the decisive confirmation of the diagnosis. This medullary compression, which is generally



a late complication, belongs to the domain of roentgenotherapy rather than to that of surgery (high voltage roentgen therapy or teleroentgenotherapy). This treatment usually leads to regression of the complications, but it can only retard the development of the malignant granulomatosis, which soon becomes roentgen resistant and from then on follows its regular course. However, the reprieve obtained in this way may not be negligible, it lasted four years in the case that was the basis of this study.

### Policlínico, Rome

45 61 108 (Feb 1) 1938 Medical Section

- \*Action of Large Doses of Sodium Glycerophosphate on Electrolytic Equilibrium and Activity of Phosphatases in Blood Serum M Levi—p 61
- Application of Tensiometer to Search for Lipases in Blood Serum M Coppo and L Marfori—p 86
- \*Relation Between Spleen and Resistance of Leukocytes R D Alessandro—p 91

**Action of Sodium Glycerophosphate on Electrolytes of Blood Serum**—Levi investigated the blood serum of persons suffering from chronic diseases of the joints, but whose blood chemistry was normal. He used normal persons for controls. Determinations of the electrolytes and of the phosphatases in the blood serum were done before and during the first three to five hours that followed the administration of an intravenous injection of from 5 to 20 cc of a 25 per cent solution of sodium glycerophosphate. The results were the same for persons in the two groups. The author concludes that large doses of sodium glycerophosphate, administered intravenously, rupture the equilibrium of the electrolytes in the blood serum. The inorganic phosphorus increases, calcium, potassium and magnesium diminish, the amount of total chlorides does not change, and the activity of the phosphatases is slightly inhibited. The ratio of calcium to phosphorus diminishes. The ratio of potassium to calcium increases or diminishes. The type and intensity of the modifications are proportional to the dose of sodium glycerophosphate injected. Variations in the electrolytes are due partly to the action of sodium glycerophosphate and partly to the effect of repeated bleeding. Some electrolytes and the phosphatases in the blood serum show periodic variations of decreasing intensity. The reaction takes place by a mechanism of adaptation of the electrolytes and their ratios to increased alkalinity of the blood serum and is transient. It is the natural reaction of the blood to increased alkalinity and not a specific reaction for sodium glycerophosphate.

**Relation Between Spleen and Resistance of Leukocytes**—D'Alessandro made determinations of the amount and resistance of the leukocytes before and after splenectomy in rabbits. He concludes that the spleen is an organ of defense against infections. The splenic tumor indicates increased activity of the spleen in capturing the leukocytes and diminishing their resistance to prepare them for the process of lysis. From the latter process, antibodies and ferments against the infection are produced. The fact that splenectomized patients or animals may resist infections as well as normal persons and animals is due to the presence of vicarious splenic-like functions by the reticulo-endothelial system. The spleen is also an organ of importance in the development of immunity, probably by the same mechanism of lowering the resistance of the leukocytes, increasing leukolysis and producing immunizing substances.

### Revista Médica de Rosario, Rosario de Santa Fe

27 1077 1166 (Nov) 1937

- Abdominal Aortography M N Vega and F P Cifarelli—p 1077
- Cystoentgenography in Diagnosis of Tumors of Bladder M Saenz—p 1086
- Complications of Gonorrhea Meningitis and Phlebitis of Femoral Vein Sara Bercoff—p 1098
- Cosmetic Surgery of the Mouth (Cheilorrhachoplasty) J A Codazzi Aguirre—p 1111
- \*How Induced Retraction of Nipple is Investigated J Benzadon—p 1132
- Hepatobiliary Pancreatic Ulcerous Syndrome J M Oriedo Bustos—p 1143

**Inducing Diagnostic Retraction of Nipple**—The sign of induced retraction of the nipple for diagnosis of cancer of the breast and of galactophoritis was described by Benzadon in the *Revista Médica de Rosario* (27 188 [March] 1937). THE JOURNAL, July 17, 1937, p 242. It consists in the internal

retraction of the nipple, which takes on the aspect of a navel when an intraglandular tumor or inflammation is inwardly repelled with the fingers. The sign is of value in early diagnosis of cancer of the breast and of galactophoritis and also in the differential diagnosis of the two conditions. A positive sign in the presence of a painless tumor deeply located in the mammary gland and mobile shows cancer, whereas in the presence of a painful inflammation it shows galactophoritis, which may be suppurative. He now emphasizes the importance of not mistaking the normal primary gland for a tumor and not holding the nipple with the fingers during the maneuvers on the breast. The tumor (or inflammation) is taken between the index finger and the thumb, above or under the nipple according to its location, and gently repelled inward. If the tumor is near the nipple the repelling of it is done with only one finger. The sign was positive in more than forty cases of intraglandular cancer or galactophoritis, as reported by the author, in all of which the diagnosis was confirmed by an anatomopathologic study. In a new series of twenty-two cases the sign was positive in six cases of cancer of the breast and in six cases of galactophoritis. It was negative in all cases of extraglandular cancer and extraglandular tumors of the breast and paramastitis.

### Zentralblatt für Gynäkologie, Leipzig

62 113 176 (Jan 15) 1938

- Radiation Treatment in Benign Hemorrhages V Probst—p 147
- Mechanism of Development of Metrorrhagia in Case of Pedicled Submucous Myomas E Pelkonen—p 150
- \*Morphologic Studies on Inhibiting Action of Estrogenic Hormone on Mammary Glands of Lactating Rats L Herold—p 155
- Inhibition of Lactation by Estrogenic Hormone W Lindemann—p 159
- Problem of Pregnancy Cystic Mole Chorionepithelioma and Aschheim Zondek Reaction F Isbruch—p 161
- Noteworthy Manifestations of Abolished Ovarian Functions and Their Modification by Hormones W Rust—p 165
- Histologic Demonstration of Effect of Percutaneously Administered Estrogenic Hormone in Kraurosis Vulvae E Tschernie—p 169

**Inhibiting Action of Estrogen on Mammary Glands**—Herold describes the morphologic behavior of the mammary glands of lactating rats following treatment with estrogen. The administration of small doses of estrogen results in a partial inhibition of the secretion of milk. Large doses effect complete suppression of lactation, particularly if the large dose is administered immediately after delivery of the litter. Thus inhibiting action of estrogen is not limited to the time of treatment but persists after the treatment has ceased. The microscopic picture of the mammary gland of the lactating animals that have been treated with estrogen is characterized by closed glandular alveoli that are free from milk and have an epithelium like covering and by the lack of secretory processes in the epithelial cells.

### Polska Gazeta Lekarska, Lwów

17 81 100 (Jan 30) 1938

- Lymphocytic Meningitis E Artwinski and A Gradzinski—p 81
- Radium in Treatment of Gynecologic Diseases and in Benign Tumors of Genital Organs of Women Z Rychlowski—p 83
- \*Bradycardia Provoked by Morphine W Tomaszewski—p 85
- Gangrene of Sole of the Foot During Course of Idiopathic Erythema (M Vaquez) Case D Rubinstein—p 86

**Bradycardia Provoked by Morphine**—Tomaszewski says that it is a known fact that morphine slows the pulse rate but that the mechanism which causes bradycardia was not known until the present time. He made experiments on healthy rabbits and on rabbits in which one or two weeks before the experiment the pressoreceptor nerves had been removed. From these experiments he concludes that bradycardia is caused by a reflex action of the morphine on the vagus nerve center through the carotid sinus and the pressoreceptor nerves but not by direct action on the vagus nerve center. The quantity of carbon dioxide in the arterial blood increases markedly under the influence of morphine because of its action on the respiratory center, while the quantity of oxygen or the oxidation of the arterial blood is decreased. When extra large doses of morphine are given the quantity of carbon dioxide in the blood after first increasing immediately starts to decrease. This phenomenon is difficult to explain and requires more experimentation.

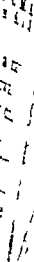
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**Abstract**